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ABSTRACT

This module was designed to assist educators in facilitating learning in health careers outside nursing. It may be used for classroom, on-the-job, or independent study. The module is organized in nine units. Each unit contains the following components: scope of unit, unit objectives, student's information assignment, reference resources used by instructor, introduction, outline, summary and conclusion, information items, classroom/laboratory activities, and evaluation items. The units cover the following topics: overview of the respiratory care profession, terminology used in respiratory therapy, basic infection control, basic telephone techniques, clinical procedures and therapeutic delivery methods, equipment identification and cleaning, equipment and laboratory material transportation, patient transfers and body mechancis for the aide, and equipment supply and inventory. References, a competency certificate, and a competency profile complete the module. (KC)

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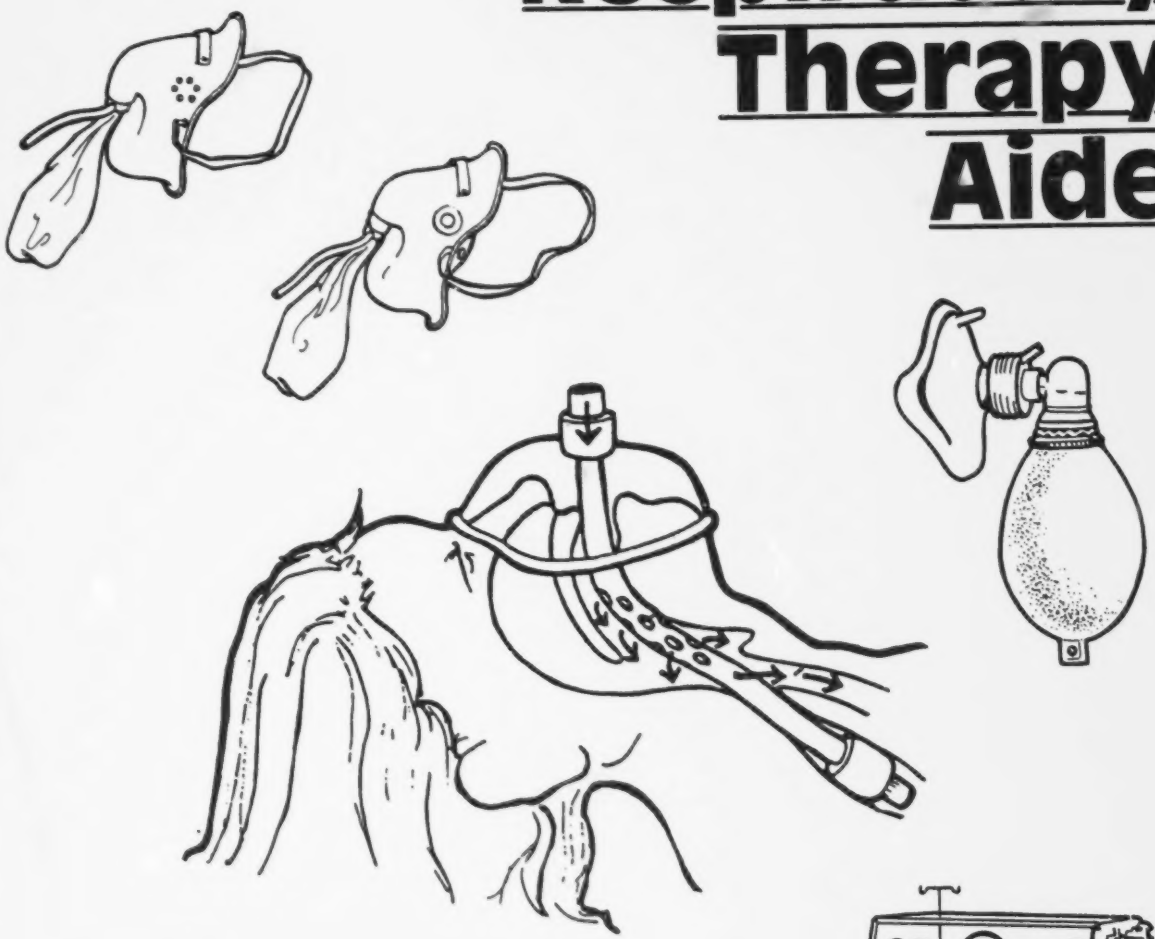
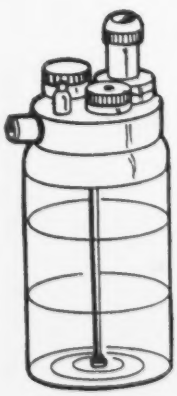
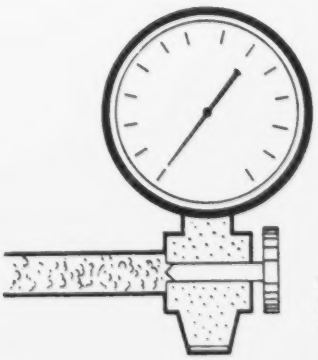
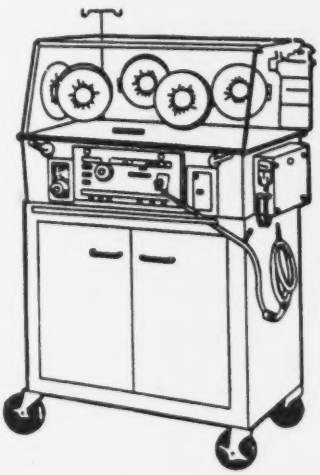
Respiratory Therapy Aide









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RESPIRATORY THERAPY AIDE

Instructor's Guide

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Produced by the Instructional Materials Laboratory
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PREFACE

This module was developed through combined efforts of dedicated individuals who are involved in the educational preparation of health care workers. Educators from both adult preparatory and postsecondary vocational programs cooperated in the design of a content outline from which this module ultimately evolved. The content outline identifies the tasks an aide-level worker in this career field would perform. Unit plans are prepared to provide instruction for each of the tasks. The end product is an instructional module to assist Health Services Assistant educators to facilitate learning in health careers outside of nursing. With nursing being the Health Services Assistant educator's expertise, the result is limited insight into allied health careers. This module will function as a mechanism to provide instruction that would otherwise be lacking.

The module may be used to:

1) Provide classroom instruction by the Health Services Assistant instructor, or
2) Assist assigned staff to provide on-the-job instruction, or
3) Provide selected units for independent study.

It is hoped that a combination of all three applications will be utilized.

The unit plans allow the curriculum guide to be prepared in short, manageable segments. Each unit contains the following components:

SCOPE OF UNIT

A teacher-centered statement that includes the goals of the unit; allows the reader to see the comprehensive content of each unit

UNIT OBJECTIVES

A listing of skills the student will be able to perform as a result of the unit instruction; provides the basis for evaluation

INFORMATION ASSIGNMENT

An assignment for which the student is responsible

REFERENCE

Resources the instructor uses to support the unit content

INTRODUCTION

A statement that sets the stage for the learning of the content; tells the student why the unit is important

OUTLINE

The content of the unit; may be informative in nature or it may be the steps of a procedure to learn a skill

SUMMARY AND CONCLUSION

Reassimilates all of the information that was included in the content of the unit; ties all of the information together in a comprehensive overview; purpose is to reinforce learning by summarizing the major components of the unit

INTERACTION ITEMS

Questions intended to stimulate and encourage student interaction during the unit presentation; allow the instructor to build on students' previous learning as well as dispel any misconceptions

CLASSROOM/LABORATORY ACTIVITIES

Activities designed to reinforce learning; allow students to interact with the new information or materials contained in the lesson

EVALUATION ITEMS

An exercise designed to measure the accomplishment of the unit objectives; may be a written evaluation or skills demonstration

The module becomes individualized when the instructor includes his/her program's philosophy and unique teaching style. Additional content may be added to increase the scope of the unit if it better serves individual programs.

The dedication with which this course was developed reflects the sincere desire of the Health Occupations Education community to provide a solid basic educational foundation for beginning students in health careers.

RESPIRATORY THERAPY AIDE

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RESPIRATORY THERAPY AIDE INSTRUCTIONAL ANALYSIS

DEMONSTRATION	INFORMATION
	1. Overview of the Respiratory Care Profession
	2. Terminology Used in Respiratory Therapy
3. Basic Infection Control	
	4. Basic Telephone Techniques
	5. Clinical Procedures and Therapeutic Delivery Methods
	6. Equipment Identification and Cleaning
	7. Equipment and Laboratory Material Transportation
8. Patient Transfers and Body Mechanics for the Aide	
	9. Equipment and Supply Inventory

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT 1 OVERVIEW OF THE RESPIRATORY CARE PROFESSION

SCOPE OF UNIT:

This unit will cover the evolution and historical development of the respiratory therapy profession. The discovery and clinical use of oxygen and the organization and structure of the field with a chronological listing of the major developments are a few of the topics to be covered. Specific job definitions outlining the type and amount of education and training required for individuals will also be discussed.

INFORMATION TOPIC: X OR DEMONSTRATION:

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. List the four areas in which respiratory therapy is involved with patient services.
2. List at least four procedures provided by respiratory therapy.
3. List at least seven conditions/diseases of patients who might receive respiratory therapy treatment.
4. State when the National Board for Respiratory Care was established.
5. List three clinical uses of oxygen therapy.
6. Distinguish between a respiratory technician and a registered respiratory therapist with regard to the length of respective educational programs.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

1. HO 1: Essentials of an Educational Program for the Respiratory Therapist and Respiratory Therapy Technician

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

Burton, George and John E. Hodgkin. Respiratory Care: A Guide to Clinical Practice. 2nd ed. Philadelphia: J.B. Lippincott Co., 1984.

INTRODUCTION:

In this lesson we shall look at the evolution of the field of respiratory therapy. This field has expanded quickly because of the technological advances of the past decade. This expansion has led respiratory therapy practitioners to view themselves in a capacity that goes beyond mere technical competence to include patient evaluation and management. We will explore the roles, job levels, education, and training necessary to become a respiratory care practitioner.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT I OVERVIEW OF THE RESPIRATORY CARE PROFESSION

OUTLINE: (Key Points)

I. Definition of the Profession of Respiratory Care - An allied health specialty under medical supervision that provides care to patients with cardiopulmonary disease. (II-1)

A. The four areas in which respiratory therapy is involved with patient services

1. Diagnosis
2. Treatment
3. Management
4. Control

B. Respiratory therapy procedures

1. Medical gas administration
2. Humidification
3. Aerosols
4. Ventilatory support
5. Bronchopulmonary drainage
6. Pulmonary rehabilitation
7. Cardiopulmonary resuscitation
8. Airway management

C. Conditions/diseases of patients who might receive respiratory therapy

1. Bacterial or viral pulmonary infections
2. Fungal infections of the lung
3. Cardiovascular disease
4. Occupational lung disease
5. Asthma

6. Chronic obstructive lung disease

7. Respiratory failure

8. Lung cancer

9. Pleural disease

10. Pulmonary embolism

11. Restrictive disease

12. Emphysema

13. Cystic fibrosis

14. Postoperative thoracic and abdominal surgery

II. Evolution of the Field of Respiratory Therapy

A. Contributions to the growth and development of respiratory therapy

1. Contributors

a. Joseph Priestly - discovered oxygen, which was produced by heating the red oxide of mercury

b. Joseph Black - discovered that carbon dioxide was the by-product of respiration and was excreted by the lungs

c. Thomas Beddoes - known as the "Father of Inhalation Therapy"

d. Antoine Lavoisier - demonstrated that oxygen was absorbed by the lungs and consumed in the body

e. A.L. Barach - devised the first oxygen tent in which carbon dioxide was removed by soda lime

f. William Randolph Lovelace II - along with Walter Boothby and Arthur Bulbulian, devised the first positive pressure mask

g. J.S. Haldane - with Joseph Barcroft, studied the effects of oxygen deficiency in human subjects

h. Arthur Guedel - first described a method for administering gases under positive pressure

2. Order of events

a. 1918 - Haldane studies effects of oxygen deficiency in humans and treats pulmonary edema

b. 1948 - official name changed to Inhalation Therapy Association

c. 1954 - official name changed to American Association of Inhalation Therapists

d. 1962 - "Essentials for Education" for approved schools developed (HO 1)

e. 1974 - National Board for Respiratory Therapy, Inc. established

f. 1981 - vigorous attempts at obtaining state legal credentialing begun nationwide

g. 1982 - "nontraditional" educational methods are accepted by the Joint Review Committee for Respiratory Therapy Education

B. Significance of the contributions to present-day therapies

1. Allowed for the use of oxygen therapy administration in many clinical situations

2. Need for additional skilled practitioners was recognized

3. Organized approach to training of respiratory care practitioners was established

III. Clinical Uses of Oxygen Therapy (II-2)

A. To treat hypoxia (hypoxemia)

1. Condition in which there is an inadequate level of oxygen in the arterial blood

2. Can lead to cellular hypoxia which directly affects the function of the vital organs

a. Heart

b. Brain

c. Kidneys

3. The administration of oxygen is of great value in treating hypoxia as it restores the pressure of oxygen in the arterial blood to normal levels.

B. To decrease the work of breathing

1. Hypoxia frequently causes increase in ventilatory work of the lungs.

2. Administration of higher concentrations of oxygen allows for normal alveolar gas exchange and decreases demand for oxygen by respiratory muscles.

C. To decrease the work performed by the heart

1. Heart normally compensates for hypoxia by increasing heart rate, which increases demand for additional oxygen and further complicates existing hypoxia.

2. Oxygen therapy effectively decreases or prevents the demand for increasing myocardial work.

IV. Organizational Structure of the Profession

A. American Association for Respiratory Care (AARC)

1. Purpose is to promote high standards in methods and professional advancement of members of the association.

2. Provides continuing education opportunities

3. Provides information about new technology and treatment

4. Acts as a forum to discuss important issues and ideas with colleagues

B. Board of Medical Advisors (BOMA)

1. Group of medical advisors active in educational, clinical, and investigative areas of respiratory therapy

2. Responsible for providing medical leadership and input to the respiratory therapy profession through AARC

C. Joint Review Committee for Respiratory Care Education (JRCTCE)

1. Responsible for assuring that respiratory therapy educational programs comply with standards adopted by American Medical Association

2. Representatives visit schools and perform periodic evaluations.

D. National Board for Respiratory Care (NBRC)

1. Establishes official credentials for the profession

2. Sets standards for admission of candidates into credentials process

3. Offers examinations for respiratory therapy practitioners

V. Types of Respiratory Care Practitioners

A. Respiratory technician (entry level)

1. Educational and clinical requirements

a. Minimum length of the educational program should be at least 10 months.

b. Training should include a clinical program with at least 800 hours of structured patient contact.

c. Units of instruction included in program

(1) Basic sciences

(a) Anatomy

(b) Physiology

(c) Chemistry

(d) Physics

(e) Microbiology

(2) Respiratory therapy

(a) Gas/humidity therapy

(b) Aerosol therapy

(c) Airway management

(d) Mechanical ventilation

(e) Blood gas procedures

(f) CPR

(g) Chest physiotherapy

(h) Pulmonary function testing

(i) Pulmonary care and rehabilitation

(j) Ethics of respiratory care

2. NBRC examination and credential

a. Exam can be taken by students who have completed an entry level program within 60 days of graduation.

b. After successful completion of the exam, the CRTT (Certified Respiratory Therapy Technician) credential is awarded.

3. Duties and responsibilities

a. CRTT specializes in the technical details of general respiratory therapeutics

b. CRTT may perform the following duties

(1) Intermittent positive pressure breathing

(2) Humidity/aerosol therapy

(3) Medical gas therapy

(4) Pulmonary drainage procedures

(5) CPR

B. Registered respiratory therapist (advanced level) (II-3)

1. Education and clinical requirements

a. Minimum length of the educational program is 20 months

b. The institution should grant at least 62 semester hours of credit or its equivalent.

c. Clinical phase should include at least 1,000 hours of structured patient contact.

d. Courses included in program

(1) Basic sciences

(a) Anatomy

(b) Physiology

(c) Chemistry

(d) Physics

(e) Microbiology

(f) Pharmacology

(2) Respiratory therapy

(a) Gas/humidity therapy

(b) Aerosol therapy

(c) Airway management

(d) Mechanical ventilation

(e) Blood gas procedures

(f) CPR

(g) Chest physiotherapy

(h) Pulmonary function testing

(i) Pulmonary care and rehabilitation

(j) Organization and administration of respiratory care department

(k) Cardiovascular testing and evaluation

(l) General patient care

2. NBRC examination and credential

a. Entry level exam can be taken by students who have completed an advanced level program within 60 days after graduation.

b. After passing entry level exam, students are eligible to take the registry exam, which is offered approximately 13 months after graduation.

c. Upon passing both the entry level and registry exams, the RRT (Registered Respiratory Therapist) credential is awarded.

3. Duties and responsibilities

a. RRT specializes in the application of scientific knowledge and theory to practical clinical problems of respiratory care.

b. RRT is qualified to assume primary clinical responsibility for all respiratory care delivery methods.

c. Responsibilities include supervision of respiratory technician functions.

VI. Summary and Conclusion

A. Definition of the profession of respiratory therapy

B. Evolution of the field of respiratory therapy

C. Clinical uses of oxygen therapy

D. Organizational structure of the profession

E. Types of respiratory care practitioners

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT I OVERVIEW OF THE RESPIRATORY CARE PROFESSION

INTERACTION ITEMS: (Review Items)

1. What does respiratory therapy involve?
2. Who discovered oxygen? When was it discovered? What are some of its clinical uses?
3. What are the differences between a certified and a registered therapist in terms of the type and amount of education required? What sort of credentials are given?

CLASSROOM, LABORATORY OR OTHER ACTIVITIES:

1. Make a list of the type of patients who might get respiratory therapy treatment.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT I OVERVIEW OF THE RESPIRATORY CARE PROFESSION

EVALUATION ITEMS:

1. Respiratory therapy is defined as an allied health specialty employed under medical supervision that provides care to patients with cardiopulmonary disease. List the four areas in which respiratory therapy is involved with patient services:

   a.

   b.

   c.

   d.

2. List at least four procedures provided by respiratory therapy.

   a.

   b.

   c.

   d.

3. List at least seven conditions/diseases of patients who might receive respiratory therapy.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

4. State when the National Board for Respiratory Care was established.

5. List three clinical uses of oxygen therapy.

   a.

   b.

   c.

6. The minimum length of a respiratory technician's educational program is:

   a. 20 months
   b. 9 months
   c. 10 months
   d. 12 months

7. The minimum length of a registered respiratory therapist's educational program is:

   a. 4 years
   b. 20 months
   c. 10 months
   d. 1 year

For each of the following, circle T if the statement is true or F if the statement is false.

8. T F Only graduates of an entry level program are eligible to take the entry level examination.

9. T F Certified technicians with a baccalaureate degree and the appropriate college credit in the basic sciences and two years' postcertification clinical experience are eligible for the registry examination.

10. T F Graduates of a therapist program who eventually pass the registry examination system will have attained both the CRTT and the RRT credential.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT I OVERVIEW OF THE RESPIRATORY CARE PROFESSION

ANSWERS TO EVALUATION ITEMS:

1. a. Diagnosis
   b. Treatment
   c. Management
   d. Control

2. Any four of the following:

   a. Medical gas administration
   b. Humidification
   c. Aerosols
   d. Ventilatory support
   e. Bronchopulmonary drainage
   f. Pulmonary rehabilitation
   g. Cardiopulmonary resuscitation
   h. Airway management

3. Any seven of the following:

   a. Bacterial or viral pulmonary infections
   b. Fungal infections of the lung
   c. Cardiovascular disease
   d. Occupational lung disease
   e. Asthma
   f. Chronic obstructive lung disease
   g. Respiratory failure
   h. Lung cancer
   i. Pleural disease
   j. Pulmonary embolism
   k. Restrictive disease
   l. Emphysema
   m. Cystic fibrosis
   n. Postoperative thoracic and abdominal surgery

4. 1974

5. a. To treat hypoxia
   b. To decrease the work of breathing
   c. To decrease the work performed by the heart

6. c

7. b

8. F

9. T

10. T

ESSENTIALS OF AN ACCREDITED EDUCATIONAL PROGRAM FOR THE RESPIRATORY THERAPIST AND RESPIRATORY THERAPY TECHNICIAN

The "Essentials for Education" are developed by the Joint Review Committee for Respiratory Therapy Education, which is organized under the auspices of the Council on Medical Education of the American Medical Association and is cosponsored by: American Association for Respiratory Therapy (AART), American College of Chest Physicians (ACCP), American Society of Anesthesiologists (ASA), and American Thoracic Society (ATS). The JRCRTE consists of twelve (12) members. Six (6) members are appointed by the AART and two (2) each by the ACCP, ASA, and ATS.

The Essentials represent the minimum requirements for an AMA accredited educational program and have been developed after extensive discussion with respiratory therapy educators, respiratory therapy practitioners and physicians. They have been endorsed by all sponsoring organizations and have been approved by the Council on Medical Education of the AMA.

DESCRIPTION OF THE OCCUPATION

Those descriptions were developed by the AART and have been approved by the Board of Directors of that organization. The JRCRTE is pleased to accept these descriptions and has designed the Essentials to provide minimum standards for education to enable the graduates of accredited respiratory therapy programs to enter their chosen profession with the necessary skills and knowledge.

Respiratory Therapist

"The respiratory therapist specializes in the application of scientific knowledge and theory to practical, clinical problems or respiratory care. Knowledge and skills for performing these functions are usually achieved through two or more years of academic and clinical preparation. The respiratory therapist is qualified to assume primary clinical responsibilities involved in supervision of respiratory technician functions."

"The therapist may be required to exercise considerable independent, clinical judgment in the respiratory care of patients under the direct or indirect supervision of a physician. Further, the therapist is capable of serving as a technical resource person to the physician with regard to current practices in respiratory care, and to the hospital staff as to effective and safe methods for administering respiratory therapy."

"The therapist's scope of patient care includes, but is not limited to: intermittent positive pressure breathing (IPPB), humidity/aerosol therapy, medical gas administration, bronchopulmonary drainage, continuous ventilation, airway management, emergency care, pulmonary function testing, cardiorespiratory rehabilitation, infection control, and cardiorespiratory drug administration."

Respiratory Therapy Technician

"The respiratory therapy technician specializes in the technical details of general respiratory therapeutics. The knowledge and skills of the technician are usually acquired through formal education programs of at least one year in length. Technicians may assume clinical responsibility for specified respiratory care modalities involving the application of well-defined therapeutic techniques under the direct or indirect supervision of a therapist or physician."

"The technician's role does not require the exercising of independent, clinical judgment, however, the technician is expected to adjust or modify therapeutic techniques within well-defined procedures and based on a limited range of patient responses. Therefore, the effective use of the technician, especially in the critical care setting, requires the supervision of a respiratory therapist or a physician experienced in respiratory care."

"In fulfillment of role, the technician may perform the following respiratory care modalities under direct or indirect supervision by a therapist or physician: intermittent positive pressure breathing (IPPB), humidity/aerosol therapy, including the administration of aerosolized medicants under physician prescription, medical gas therapy, pulmonary drainage procedures, and cardiopulmonary resuscitation. Further, the technician may be instructed in infection control, cleaning, sterilization, and general maintenance of respiratory therapy equipment."

CURRICULUM

Registered Respiratory Therapist

The minimum length of the educational program for the training of respiratory therapists shall be no less than 20 calendar months, and the institution shall grant a minimum of 62 semester hours credit or its equivalent.

Instruction in all programs shall follow a planned outline. There shall be a group of didactic courses accompanied or followed by a series of structured clinical experiences. There shall be sufficient laboratory courses and exposure to thoroughly familiarize all students with respiratory therapy equipment prior to entry into the clinical phase of the program.

The following general outline of instruction includes only the absolute minimum requirements and does not include courses in the arts, humanities, or social sciences which may be required by law or be offered as electives.

1. Basic units of instruction

    a. General science to include biology, chemistry, physics, and mathematics
    b. General anatomy and physiology
    c. Cardiopulmonary-renal anatomy and physiology
    d. Microbiology
    e. Pharmacology
    f. Clinical topics

1) General medicine and medical subspecialities
2) Cardiovascular disease
3) Diseases of the respiratory system and disorders of breathing
4) General surgery and surgical subspecialities
5) Pediatrics (including perinatology)
6) Anesthesiology
7) Patient psychology and communication

2. Respiratory therapy units of instruction

a. Gas therapy
b. Humidity therapy
c. Aerosol therapy
d. Airway management
e. Mechanical ventilation therapy
f. Blood gas analysis and interpretation
g. Cardiopulmonary resuscitation
h. Chest physiotherapy
i. General patient care (i.e., nursing principles)
j. Cardiovascular evaluation and testing
k. Pulmonary function testing
l. Pulmonary rehabilitation and home care
m. Organization and administration of respiratory therapy departments
n. Ethics of respiratory therapy and medical care

Basic Units of Instruction: These courses must encompass a thorough and detailed discussion of the general subjects and must combine both didactic instruction and structured laboratory experiences. The base of all courses must be broad and must review the respective areas in their entirety, well beyond the specific and particular requirements of clinical respiratory therapy. The students must have a clear understanding of the basic sciences and how basic principles relate to the clinical applications of the specialty. A general overview of the mathematical principles, of biological sciences and of pathology, microbiology, clinical medicine, and therapeutics must be accompanied by special, in-depth study of cardiopulmonary and renal anatomy, physiology, pathology, clinical management and therapeutics. In these areas the level of instruction must be similar to those ordinarily provided to medical students since the fully trained respiratory therapist must communicate with and, indeed, advise physicians and nurses not specifically trained in respiratory care.

Respiratory Therapy Units: These areas are the technical portions of the field of respiratory therapy. The students must be brought to a level of understanding and competence which is unique among all health care providers. This cannot be done unless the courses in these units are a judicious mixture of instruction in the mechanical, physiological, and clinical principles involved and extensive opportunity to obtain knowledge and skill in a well equipped laboratory where the students have the opportunity to use, evaluate, and maintain the various types of equipment used in respiratory care.

Clinical Instruction: The JRCRCE, based on most recent experience, concludes that a program of clinical instruction cannot assure clinical competence in modern respiratory therapy unless at least 1,000 hours of structured patient contact are provided.

Certified Respiratory Therapy Technician

The minimum length of the educational program for the training of respiratory technicians shall be no less than ten calendar months.

Instruction in all programs shall follow a planned outline. There shall be a group of didactic courses accompanied or followed by a series of structured clinical experiences. There shall be sufficient laboratory courses and exposure to thoroughly familiarize all students with respiratory therapy equipment prior to entry into the clinical phase of the program.

The following general outline of instruction includes only the absolute minimum requirements and does not include courses in the arts, humanities, or social sciences which may be required by state law or be offered as electives.

1. Basic units of instruction

   a. General science to include biology, chemistry, physics, and mathematics
   b. General anatomy and physiology
   c. Cardiopulmonary-renal anatomy and physiology
   d. Microbiology
   e. Pharmacology
   f. Clinical topics

      1) General medicine and medical subspecialties
      2) Cardiovascular diseases
      3) Diseases of the respiratory system and disorders of breathing
      4) General surgery and surgical subspecialties
      5) Pediatrics (including perinatology)
      6) Anesthesiology
      7) Patient psychology and communication

2. Respiratory therapy units of instruction

   a) Gas therapy
   b) Humidity therapy
   c) Aerosol therapy
   d) Airway management
   e) Mechanical ventilation therapy
   f) Blood gas analysis and interpretation
   g) Cardiopulmonary resuscitation
   h) Chest physiotherapy
   i) General patient care (i.e., nursing principles)
   j) Cardiovascular evaluation and testing
   k) Pulmonary function testing
   l) Pulmonary rehabilitation and home care

m) Organization and administration of respiratory therapy departments
n) Ethics of respiratory therapy and medical care

Basic Units of Instruction: These courses must encompass discussion of the general subjects and must combine both didactic instruction and structured laboratory experiences. The base of all courses must be broad and must review the respective areas in their entirety beyond the specific and particular requirements of clinical respiratory therapy. The students must have an understanding of the basic sciences and how basic principles relate to the clinical applications of the specialty. A general overview of the mathematical principles, of biological sciences and of pathology, microbiology, clinical medicine and therapeutics must be accompanied by special study of cardiopulmonary and renal anatomy, physiology, pathology, clinical management, and therapeutics.

Respiratory Therapy Units: These areas are the technical portions of the field of respiratory therapy. The students must be brought to a high level of understanding and competence. This cannot be done unless the courses in these units are a judicious mixture of instruction in the mechanical, physiological, and clinical principles involved and extensive opportunity to obtain knowledge and skill in a well equipped laboratory where the students have the opportunity to use, evaluate, and maintain the various types of equipment used in respiratory care.

Clinical Instruction: The JRCRCE, based on most recent experience, concludes that a program of clinical instruction cannot assure clinical competence in modern respiratory therapy unless at least 800 hours of structured patient contact are provided.

(Ed. note - The Essentials for Education, from which the above is excerpted, were adopted by the Council on Medical Education of the AMA Sept. 9, 1977.)

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT II TERMINOLOGY USED IN RESPIRATORY THERAPY

SCOPE OF UNIT:

This unit will review the word elements of prefixes, suffixes, and root words. Terms commonly associated with respiratory therapy also will be covered.

INFORMATION TOPIC: X OR DEMONSTRATION:

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. Define the three parts of a word.

2. Match terms commonly used in the field of respiratory therapy to definitions.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

1. HO 1: Word Elements
2. HO 2: Glossary of Prefixes and Suffixes
3. HO 3: Abbreviations used According to Time and Hour of Administration
4. HO 4: Other Common Abbreviations
5. Medical Dictionary

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

Brady's Programmed Orientation to Medical Terminology. Philadelphia: J.B. Lippincott Co., 1970.

INTRODUCTION:

Medical terminology consists of words which are related to medical science. Such words can be used to describe the respiratory system, normal and abnormal disease states, diseases that affect the respiratory system, and the various means, agents, and procedures used to prevent, cure, or reduce the effects of a disease. An interpretation of these words can be made easily once the term is broken into the root word and the prefix or suffix that has been added to it.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT II TERMINOLOGY USED IN RESPIRATORY THERAPY

OUTLINE: (Key Points)

I. Parts of a Word

A. Root word - the main part of a word, usually Latin or Greek, may or may not be a complete word by itself.

B. Prefix - a word part placed at the beginning of a word or another word part (HO 1, HO 2) (II-1)

1. pre means "before"

2. fix means "attach"

C. Suffix - a word part that is added (fixed) to the end of a word or another word part (HO 1, HO 2) (II-2)

II. Terms Used in Respiratory Therapy (HO 3, HO 4)

A. Acid-base balance - regulation of hydrogen ion concentration in the body fluids

B. Aerosol - a suspension of fine or solid particles in air or a gas

C. Alveolar ventilation - the amount of air moving in or out of the lungs which is directly involved in gas exchange

D. Anaerobic - growing only in the absence of molecular oxygen

E. Antiseptic - both aseptic and antiseptic; a substance that will inhibit the growth and development of microorganisms without necessarily destroying them

F. Apnea - transient cessation of the breathing impulse that follows forced breathing

G. Artificial ventilation - the forcing of air in and out of lungs by artificial means

H. Asepsis - freedom from infection

I. Aspiration - the act of breathing or drawing in; the removal of fluids or gases from a cavity by means of an aspirator

J. Asthma - a disease marked by recurrent attacks of paroxysmal dyspnea, with wheezing, cough, and a sense of constriction, due to spasmodic contraction of the bronchi and bronchioles

K. Atelectasis - incomplete expansion or collapse of pulmonary alveoli, or of a segment, lobe, or lobes of a lung

L. Bacteriostatic - inhibiting the growth or multiplication of bacteria

M. Blood gas - refers to the partial pressures of oxygen and carbon dioxide in the arterial blood; the pressure of each gas is proportional to its percentage in the total mixture

N. Bronchospasm - spasmodic narrowing of the caliber of the bronchial tubes

O. Bronchodilator - dilating or expanding the lumina of air passages of the lungs

P. Carbon dioxide - an odorless, colorless gas resulting from the oxidation of carbon; formed in the tissues and excreted by the lungs

Q. CPPB - continuous positive pressure breathing- application of positive pressure on both the inspiratory and expiratory phase of breathing; pressure remains in the lungs at end of expiration

R. Dead space - an area ventilated but not perfused

1. Anatomic: the mouth, the nose, the pharynx, the larynx, the trachea, the bronchi, and the bronchioles

2. Mechanical: space in breathing apparatus outside the patient where the expired air is trapped and then reinhaled

3. Physiologic: includes the volume of the inspired gas which occupies the anatomic dead space and volume which ventilates the alveoli that are not perfused by capillary blood flow

S. Detergent - an agent which cleanses or purifies and helps to loosen respiratory tract secretion

T. Diagnosis - the art of distinguishing one disease from another

U. Dyspnea - difficult or labored breathing

V. Expectorant - a medicine which aids in the expulsion of mucous or exudate from the lungs, bronchi, and trachea

W. Extubate - to remove a tube which has been inserted for the introduction of air

X. Hemoglobin - the oxygen-carrying red pigment of the red corpuscles

Y. Hyperventilation - abnormally prolonged, rapid, and deep breathing frequently used as a test procedure in epilepsy and tetany; also the condition produced by overbreathing oxygen at high pressures; marked by confusion, dizziness, numbness, and muscular cramp brought on by such breathing. Ventilation greater than that necessary to maintain normal arterial blood gases.

Z. Hypopnea - decreased depth of breathing

AA. Hypoventilation- decrease of the air in the lungs below the normal amount; underbreathing

BB. Hypoxia - low oxygen content or tension; deficiency of oxygen in the inspired air

CC. Infection - invasion of the body by pathogenic microorganisms and the reaction of the tissues to their presence and to the toxins generated by them

DD. Intubate - to insert a tube for the introduction of air

EE. IPPB - intermittent positive pressure breathing; active inflation of the lungs during inspiration under pressure from a cycling valve

FF. Laryngoscope - instrument for examining the larynx

GG. Liter - the basic unit of capacity on the metric system; the volume occupied by one kilogram of pure water at its temperature of maximum density and under standard atmospheric pressure, equivalent to 1.0567 quarts liquid measure

HH. Manual ventilation - use of a hand-operated bag to aerate a patient's lungs

II. Mask - an appliance which covers the nose and mouth and can be used for administration of a gas, vapor, or aerosol

JJ. Nebulizer - an apparatus designed to break a liquid into droplets of microscopic size, then project them on an air current

KK. Orthopnea - inability to breathe unless in an upright position

LL. Oxygen - a gaseous element existing free in air and in combination in most nonelementary solids, liquids, and gases; atomic number- 8; atomic weight- 16; symbol- O_2; constitutes 20% by weight of the atmospheric air; is the essential agent in the respiration of plants and animals by inhalation, and is necessary to support combustion; administered to patients with pulmonary diseases

MM. PCO_2 - symbol for carbon dioxide pressure (tension)

NN. pH - the symbol commonly used in expressing hydrogen ion concentration, the measure of alkalinity and acidity; pH 7 is the neutral point, above 7 alkalinity increases, below 7 acidity increases; normal arterial pH is 7.35 - 7.45

OO. Pleura - serous membrane that invests the lungs and lining of the thoracic cavity and encloses the potential space; the pleural cavity.

PP. Pneumothorax - presence of air in the thoracic cavity, an accumulation of air or liquid in the pleural cavity; the air enters either by an external wound, a lung perforation from burrowing abscesses, or from the rupture of a superficial lung cavity; pneumothorax is attended with sudden and severe pain and rapidly increasing dyspnea

QQ. Resuscitation - the restoration to life or consciousness of one apparently dead

RR. Sputum - matter ejected from the mouth; saliva mixed with mucous and other substances from the respiratory tract

SS. Sterilization - the complete destruction of microorganisms by heat (wet steam under pressure at 120 degrees C for 15 minutes, or dry heat at 360-380 degrees C for 3 hours), or by bactericidal chemical compounds

TT. Tidal volume - volume of gas inspired or expired per breath

UU. Ventilation - act of breathing; the act by which air is drawn in and expelled from the lungs, including inspiration and expiration

VV. Venturi - employed in respiratory therapy equipment, designed to draw in a second gas to mix with a main flow gas by blowing a high flow of gas through a restricted area

WW. Vital capacity - the measure of the number of cubic centimeters of air expired forcibly after a full inspiration

III. Summary and Conclusion

A. Parts of a word

B. Terms used in respiratory therapy

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COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT II TERMINOLOGY USED IN RESPIRATORY THERAPY

INTERACTION ITEMS:

1. What is a prefix? Give an example of a term using a prefix.
2. What is a suffix? Give examples of terms that use a suffix.

CLASSROOM, LABORATORY OR OTHER ACTIVITIES:

1. Using instructor-made flash cards, conduct an in-class drill on prefixes, suffixes, and word roots presented in HO 1 and HO 2.
2. Have students generate their own medical terms by combining word roots and prefixes, word roots and suffixes, or words roots, prefixes, and suffixes. They can verify the existence of a newly generated word by checking a medical dictionary. It may be desirable to give the students additional word elements to work with.
3. Have students develop crossword puzzles using medical terms. Use standard graph paper.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT II TERMINOLOGY USED IN RESPIRATORY THERAPY

EVALUATION ITEMS:

1. Define the three parts of a word.

   a.

   b.

   c.

Match the following terms to correct definitions.

_____	2. Aerosol	a. Refers to the partial pressures of oxygen and carbon dioxide in the arterial blood; the pressure of each gas is proportional to its percentage in the total mixture
_____	3. Antiseptic	
_____	4. Apnea	
_____	5. Blood gas	b. The complete destruction of microorganisms by heat (wet steam under pressure at 120 degrees C for 15 minutes or dry heat at 360-380 degrees C for 3 hours) or by bactericidal chemical compounds
_____	6. Dyspnea	
_____	7. Expectorant	
_____	8. Nebulizer	c. Matter ejected from the mouth; saliva mixed with mucous and other substances from the respiratory tract
_____	9. Sputum	
_____	10. Tidal volume	d. Volume of gas inspired or expired per breath
_____	11. Sterilization	
		e. Transient cessation of the breathing impulse that follows forced breathing
		f. Difficult or labored breathing
		g. Both aseptic and antiseptic; a substance that will inhibit the growth and development of microorganisms without necessarily destroying them
		h. A medicine which aids in the expulsion of mucous or exudate from the lungs, bronchi, and trachea

(more definitions on following page)

i. An apparatus designed to break a liquid into droplets of microscopic size, which are then projected on an air current

j. Suspension of fine or solid particles in air or gas

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT II TERMINOLOGY USED IN RESPIRATORY THERAPY

ANSWERS TO EVALUATION ITEMS:

1. a. Root word - the main part of a word, usually Latin or Greek, may or may not be a complete word by itself.

   b. Prefix - a word part placed at the beginning of a word or word part

   c. Suffix - a word part that is added (fixed) to the end of a word or word part

2. j
3. g
4. e
5. a
6. f
7. h
8. i
9. c
10. d
11. b

WORD ELEMENTS

I. Prefixes

A. Prefixes related to position regarding time and place

1. Ana - up or back again
2. Noct(i) - night
3. Post - after
4. Pre - before
5. Ter - third

B. Prefixes describing position in relation to other parts

1. Contra - opposite or against
2. Hyper - above, excessive, beyond
3. Hypo - below or under
4. Inter - between
5. Ob - against

C. Prefixes related to type

1. A, an - without or absent
2. Atel - imperfect
3. Brady - slow
4. Tachy - rapid
5. Dys - difficult or abnormal
6. Eu - good or normal

D. Prefixes relating to color

1. Cirrh - yellow
2. Cyano - blue
3. Erythro - red
4. Leuko - white
5. Rube - means red

II. Suffixes

A. Suffixes which denote a state or condition

1. Algia - pain
2. Ema - swelling or distension
3. Itis - inflammation
4. Oma - tumor
5. Pathy - suffering or disease

B. Suffixes which indicate a surgical or diagnostic procedure

1. Centesis - puncture of a cavity
2. Ectomy - excision or cutting out
3. Ostomy - creation of a mouth or opening
4. Otomy - cut into
5. Scope, scopy - looking at or examining

Glossary of Prefixes and Suffixes

PREFIX	DEFINITION
a-,an-	without, absent
ab-	away from
acro-	extremity, tip
ad-	to, toward
alba-	white
allo-	another, different
ambi-	both
ambly-	dull
amphi-	both, double
ana-	up, back again
andro-	male
angi(o)-	vessel, duct
anis(o)-	unequal
ankyl(o)-	crooked, bent, stiff, fused
ante-, antero-	before
anti-	against
apo-	separation or deviation from
atel-	imperfect
auto-	self
bacter-	bacteria
bi-	two
bi(o)-	life
brachy-	short
brady-	slow
bevis-	short, slow
cac(o)-	bad, ill
cata-	down, through
centi-	100
chloro-	green
chromo-	color
circum-	around
cirrh-	yellow
clin(o)-	sloping toward or away from
co-, com-, con-	with, together
contra-	opposite, against
cry(o)-	cold
crypt(o)-	hidden
cyano-	blue
de-	away, not, down
deca-	10
demi-	one-half
dextr(o)-	right
di-, dis-	twice, doubly
dia-	through, between, completely
dis-	separation
dorso-, dorsi-	back
dys-	difficult, abnormal
e-	out
ecto-	outside, misplaced
endo-	within
epi-	on, upon, over

PREFIX	DEFINITION
erythro-	red
eso-	within
eu-	good, normal
eury-	broad, wide
ex-	away from, out completely
extra-	outside of, in addition to, beyond
fore-	before, in front of
gen-	beginning, origin
glyco-, bluco-	sugar, sweet
gyn-, gyneco-	female
haplo-	single, simple
hemi-	half
hetero-	other, different
holo-	whole, all
homeo-	unchanged
homo-	same
hydra-, hydro-	water
hyper-	above, excessive, beyond
hypo-	below, under
idio-	peculiar to the individual, distinct
in-, im-	in, inside, without, not
infra-	below
inter-	between
intra-	within a part
ir-	against, into, toward
iso-	equal, same
juxta-	near
kata-	down, through
lepto-	small, slender, soft
leuko-	white
levo-	left
lute-	yellow
macro-	large
mal-	bad
medi-	middle
mega-	large
melano-	black
meso-	middle
meta-	beyond, over, between, change, next to
micro-	small
milli-	1000
mio-	less, smaller
mono-	one
multi-	many

PREFIX	DEFINITION
neo-	new, strange
nigro-	black
noct(i)-	night
non-	not
normo-	normal
null(i)-	none
nyct(o)-	night
ob-	against
olig(o)-	little, small
opisth-	backward
ortho-	straight, erect, normal, correct
oxy-	acute, sharp
pachy-	thick
paleo-	old
pan-	all
para-	beside, beyond
path(o)-	disease, suffering
per-	excessive, through, by means of
peri-	around
phage(o)-	eat, consume
platy-	broad, wide
pleo-	more, many
plic(o)-	fold
plur(i)-	many, more
poikilo-	varied
poly-	many
post-	after
pre-	before
prim-	first
pro-	for, in front of, before
proso-	forward, anterior
prot(o)-	first
pseudo-	false
quadr(i)-	four
re-	back, again
retro-	behind, backward
rube-	red
schisto-, schizo-	split, divided
sclero-	hard
semi-	half
sinistr(o)-	left
steno-	contracted, narrow
stereo-	solid, three-dimensional, firmly established
sub-	beneath
super-	above, excessive, beyond
supra-	above, over
sym-, syn-	together, union
tachy-	fast
tele-	distant, far
telo-	end
terat(o)-	malformed, monster
ter(t)-	third
tetra-	four
therap-	treatment
thermo-	heat, warm
toxic-	poison
trachy-	rough
trans-	across, through, over, beyond
tri-	three
ultra-	above, excessive, beyond
uni-	one
xantho-	yellow
xero-	dry

SUFFIX	DEFINITION
-a	(pl) -ae
-ac	pertaining to
-acy	that which is, pertaining to
-ad	toward, in the direction of
-agogue	leading, inducing
-agra	severe pain, seizure
-al	pertaining to
-algia	pain
-an	pertaining to, belonging to
-ance	quality or act of
-ar	pertaining to
-ary	related to, pertaining to
-ase	enzyme (chemistry)
-ate	that which is acted upon, salt made form acid (chemistry)
-atresia	abnormal closure
-cele	swelling, tumor, bulging hernia
-centesis	puncture of a cavity
-cide	killer
-cis	cut
-clasis, -clasia	breaking up
-cleisis	closure
-cle	small
-cule	small
-culum	small
-culus	small
-cyst	sac or bladder
-desis	binding, fusion
-dom	state of being
-dynia	pain
-en	(pl) -ina
-ectasia, -ectasis	dilation or expansion of
-ectomy	excision, cutting out

Glossary of Prefixes and Suffixes - Continued

SUFFIX	DEFINITION
-ema	swelling, distention
-ene	unsaturated compound (chemistry)
-et	facet
-ex	(pl) -ices
-form	structure, shape
-fugal	driving or traveling away from
-ful	full of, characterized by
-gen	production of
-gram, -graphy	act or method of recording diagnostic information
-hood	state, quality of, condition
-ia, -iasis	a diseased condition
-ic	pertaining to
-ician	one charged with or skilled in care of
-id	condition
-ide	binary compound (chemistry)
-ies	(pl) -ietes
-ile	pertaining to, having the qualities of
-in, -ine	halogen, alkaloid, or nitrogen base (chemistry)
-ion	act of, state of, result of
-ious	capable of, causing
-is	(pl) -es, -ides
-ism	condition, act of, process
-ist	one charged with or skilled in
-itis	inflammation
-ity	quality of, state of
-ium	small
-ive	that which performs or tends toward
-less	without, not capable of
-lysis	setting free, dissolution
-ma	(pl) -mata
-malacia	softening
-meter	measure
-ness	quality of, state of
-nx	(pl) -nges
-oid	like
-ol	oil (chemistry)
-ole	small
-ology	science of
-olum	small
-olus	small
-oma	tumor

SUFFIX	DEFINITION
-on	(pl) -a, elementary atomic particle, unit, nonmetallic chemical element
-or	that which, one who
-ory	process of, pertaining to, function of
-ose	having the qualities of, full of carbohydrate (chemistry)
-osis	a diseased condition
-ostomy	creation of a mouth or opening
-otomy	cut into
-ous	pertaining to
-pathy	suffering, disease
-penia	deficiency, lack
-pexy	fixation
-philia	love of
-phobia	fear of
-phylaxis	protection
-plasty	to mold or shape
-poiesis	production, formation of
-ptosis	dropping or downward displacement
-rrhaphy	closure by suturing, repair
-rrhage, -rrhagia	bursting forth
-rrhea	flow, discharge
-s	(pl)-tes
-scope, -scopy	looking at, examining
-sect	cut
-ship	state of, quality of
-some	tendency, like
-stasis	state of being at a standstill
-sthenia	strength
-tion	act of, result of, process of
-tome	instrument for cutting
-tonia	stretching, putting under tension
-tripsy	a rubbing, crushing
-trophic	related to nutrition, growth, development
-tropic	turning toward or changing
-u	(pl) -ua
-um	(pl) -a
-us	(pl) -i, -era, -ora
-ure	act or result of action
-vert	turn
-x	(pl) -ces, -cis
-y	having the nature or quality of
-yl	radical substance (chemistry)

ABBREVIATIONS USED ACCORDING TO TIME AND HOUR OF ADMINISTRATION

1. a.c. - before food or meals
2. b.i.d. - two times a day
3. h. - hour
4. h.s. - at bedtime or hour of sleep
5. n. or noc. - night
6. p.c. - after food or meals
7. p.r.n. - as necessary or as required
8. q. - every
9. q.i.d. - four times a day
10. q.2.h. - every two hours (use with any number)
11. stat. - immediately or at once
12. t.i.d. - three times a day

OTHER COMMON ABBREVIATIONS

1. abd. - abdomen
2. ant. - anterior
3. B.P. - blood pressure
4. CCU - cardiac care unit
5. CHF - congestive heart failure
6. COPD - chronic obstructive pulmonary disease
7. C.S. - central supply
8. ECG, EKG - electrocardiogram
9. ER - emergency room
10. ICU - intensive care unit
11. IPPB - intermittent positive pressure breathing
12. IS - incentive spirometry
13. NPO - nothing by mouth
14. O.R. - operating room
15. PFT - palm function testing
16. pt. - patient
17. P.T. - physical therapy
18. R.R. - recovery room
19. R.T. - respiratory therapy
20. SOB - short of breath
21. TPR - temperature, pulse, and respiration

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT III BASIC INFECTION CONTROL

SCOPE OF UNIT:

This unit addresses the purpose of basic infection control procedures, which is to reduce or prevent the transmission of infection to patients or other hospital employees. The correct handwashing technique, the correct technique for maintaining asepsis, and the correct isolation technique will be demonstrated.

INFORMATION TOPIC: OR DEMONSTRATION: X

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. Wash hands according to steps of procedure.
2. Maintain asepsis while handling equipment according to steps of procedure.
3. Demonstrate isolation technique according to steps of procedure.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

1. Sink
2. Soap or liquid washing agent (Betadine)
3. Paper towels
4. Hair coverings (disposable)
5. Masks (disposable)
6. Shoe coverings (disposable)
7. Gowns (disposable)
8. Gloves (sterile)
9. Trash container

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

Burton, George and John E. Hodgin. Respiratory Care: A Guide to Clinical Practice. 2nd ed. Philadelphia: J.B. Lippincott Co., 1984.

INTRODUCTION:

It is essential that infection control be practiced by all hospital employees while performing patient care activities. Handwashing is one of the most important (and most neclected) techniques in preventing the spread of infection of hospital (nosocomial) origin. Handwashing should be done prior to patient care activities and the handling of any equipment that is sterile.

Certain situations also require special precautions to prevent or reduce the incidence of infection. Isolation technique is used to either prevent transmission of an infectious disease or to protect a patient with a reduced resistance to infectious disease.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT III BASIC INFECTION CONTROL

STEPS OF PROCEDURES:

Handwashing Technique for Medical Asepsis

1. Remove all jewelry.
2. Turn water on, adjust to a moderately hot temperature, and let run throughout the procedure.
3. Wet hands and lower arms with water and apply soap or liquid washing agent.
4. Scrub for two minutes all surfaces of the hands and lower arms including palms and back of hands, fingers and surfaces between them, and wrists (3 to 4 inches above hands).
5. Rinse well under running water, beginning at the fingertips and rinsing toward the wrist.
6. Dry hands thoroughly with paper towels.
7. If the sink does not have foot controls, turn the faucet off using a dry paper towel.
   CAUTION: be careful not to touch the sink with hands.
8. Dispose of the towels in the trash.
   CAUTION: be careful not to touch the container.

Maintaining Asepsis

1. Wash hands.
2. Handle only sterile or disinfected equipment and/or supplies.
3. When handling equipment and/or supplies, avoid contact with objects which may be contaminants.
4. Should you have contact with any object you suspect is contaminated, dispose of the object and repeat steps 1-8 of handwashing technique. Replace sterile or disinfected equipment and/or supplies.

Isolation Technique

1. Wash hands.
2. If isolation requires hair covering, place covering over head.
   CAUTION: Make sure to cover all hair.

3. Put on mask.
   CAUTION: Make sure to completely cover nose and mouth.

4. If the isolation requires shoe coverings, place them over shoes.
   CAUTION: Make sure shoes are covered completely.

5. Put on gown in the following manner:

   a. Remove gown from package handling by neck ties only.

   b. Put gown on.
      CAUTION: Make sure not to touch the outside.

   c. Tie neck and waist ties, while avoiding touching the outside front of gown.

6. Put on gloves (either sterile or clean, depending on the type of isolation).
   CAUTION: Make sure hands and wrists are covered completely.

Discarding Protective (Isolation) Clothing

1. Remove shoe coverings and discard in appropriate container.

2. Remove gloves and discard in appropriate container.

3. Remove gown using the following procedure:

   a. Undo neck and waist ties.

   b. Pull off one sleeve by reaching under the cuff.

   c. Using the sleeve-covered hand, pull off the second sleeve.

   d. Fold gown inside-out.

   e. Discard in appropriate container.

4. Remove mask and discard in appropriate container.

5. Remove hair covering and discard in appropriate container.

6. Wash hands.

Summary and Conclusion

Review steps of procedure.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT III BASIC INFECTION CONTROL

INTERACTION ITEMS: (Review Items)

1. What should you do before washing your hands?
2. How long should you scrub your hands?
3. Why is it important not to touch the outside of the gown?
4. Why do you remove the hair covering before taking off your gloves?

CLASSROOM, LABORATORY OR OTHER ACTIVITIES:

1. Discuss interaction items.
2. Have students practice various infection control techniques

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT III BASIC INFECTION CONTROL

EVALUATION ITEMS:

Did The Student:	Yes	No
HANDWASHING TECHNIQUE FOR MEDICAL ASEPSIS		
1. Remove all jewelry.		
2. Turn on water, adjust to correct termperature.		
3. Wet hands and lower arms with water and apply soap or liquid washing agent.		
4. Scrub for two minutes all surfaces of the hands and lower arms.		
5. Rinse hands.		
6. Dry hands.		
7. Turn off the faucet using a dry paper towel.		
8. Dispose of towels.		
MAINTAINING ASEPSIS		
1. Wash hands.		
2. Handle only sterile or disinfected equipment and/or supplies.		
3. When handling equipment and/or supplies, avoid contact with objects that may be contaminants.		
4. Dispose of any objects suspected of being contaminated and with which contact was made, wash hands, and replace sterile or disinfected equipment and/or supplies.		

ISOLATION TECHNIQUE	Yes	No
1. Wash hands.		
2. If isolation requires hair covering, place covering over head.		
3. Put on mask.		
4. Put on shoe coverings.		
5. Put on gown.		
6. Put on gloves.		
DISCARDING PROTECTIVE (ISOLATION) CLOTHING		
1. Remove shoe coverings and discard.		
2. Remove gloves and discard.		
3. Remove gown and discard.		
4. Remove mask and discard.		
5. Remove hair covering and discard.		
6. Wash hands.		

The student has satisfactorily completed the procedure "BASIC INFECTION CONTROL" according to the steps outlined.

_____

Instructor's Signature
(Verifying Satisfactory Completion)

_____

(Date)

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COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IV BASIC TELEPHONE TECHNIQUES

SCOPE OF UNIT:

This unit introduces the concept of correct telephone use in the place of business. There are some special rules that apply to telephone use in a professional or business environment that must be learned and followed.

INFORMATION TOPIC: X OR DEMONSTRATION:

UNIT OBJECTIVES- THE STUDENT WILL BE ABLE TO:

1. List two criteria for answering incoming telephone calls.
2. List three steps in recording a phone message.
3. Identify the proper method of terminating a telephone conversation.
4. Identify ineffective telephone techniques.
5. Identify effective telephone techniques.
6. Given two hypothetical situations, describe how the respiratory therapy aide would respond correctly and professionally to each.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

1. HO 1: Telephone Techniques for the Health Professional

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

INTRODUCTION:

A person who is trained in proper use of the telephone can have a positive effect on building a professional atmosphere in the place of work. The telephone conversation may be the only contact with the caller. Over the telephone, we do not have the advantage that we have in person when we are able to smile, use friendly gestures, and offer a warm handshake. On the phone, we must make up the difference with our voice and how well we come across to the caller. Remember, the person calling cannot see you and can only judge you and your place of employment through the all-important telephone conversation.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IV BASIC TELEPHONE TECHNIQUES

OUTLINE: (Key Points)

I. Criteria for Answering Telephone Calls (H01)

A. Answer the phone on the first ring, if possible.

B. Identify the department or office by name.

C. Identify yourself by your first and last name.

D. Follow up with an appropriate phrase like "How may I help you?"

E. Find a pencil and piece of paper as you are starting the conversation and introducing yourself. "This is the _____ department; _____ speaking, may I help you?" By this time, you should have located a note pad and pencil or pen.

F. Display courtesy.

1. Use a natural and sincere manner of speaking.

2. Use a friendly tone of voice.

3. Develop an attitude of wanting to help other people. This positive attitude will come across on the phone.

4. Do not use standard phrases like "have a nice day" over and over again for every caller, but say something original that is appropriate to the person calling.

II. Recording a Telephone Message

A. Determine the purpose of the call by listening to the caller and asking questions for clarification.

B. Obtain information by asking the caller's name and phone number if he/she is leaving a message or making an appointment.

C. Clarify the information by repeating the message back to the caller to make sure it is accurate.

III. Termination of Phone Calls

A. End the call in a sincere and agreeable manner.

B. Let the caller know that you were glad to be of service.

C. Try to allow the caller hang up first.

IV. Effective Telephone Techniques

A. Answer promptly.

B. Be prepared to take notes.

C. Repeat the caller's name frequently.

D. Space outgoing calls to allow incoming calls to come through.

E. If you must put someone on hold, take the name and number of the second caller and return to the first caller, apologizing for the delay.

F. If it is necessary to leave the phone, tell the caller how long you will be gone. Upon returning, greet the caller by name again and apologize for any unavoidable delay.

G. Speak distinctly and unhurriedly.

V. Ineffective Telephone Techniques

A. Do not just say "hello," state your department name and then your name followed by a statement like "May I help you?"

B. Do not say "Hold on for just a second," say, "I will need to put you on hold for a minute or two Mr./Mrs./Ms. _____. I will be right back."

C. Never provide patient information to anyone over the phone even if they say they are representing the patient. The only exception is if you know the person to whom you are speaking and they are privileged to have the information (i.e., if the patient's doctor or doctor's nurse calls and wants an oral report.)

D. Never contradict or argue with a caller.

E. Never say no to an emergency. The caller may think it is an emergency and you may not think so. Meet the caller's needs.

F. Avoid losing your poise or becoming angry.

G. Do not discuss fees or charges over the phone.

H. Do not say "The doctor is busy," say, "The doctor is with a patient and cannot come to the phone at this time. Is there anything that I may be able to do to help you?"

I. Never hang up on someone out of anger or frustration.

J. Avoid using slang words and phrases and giving casual responses.

1. "Okay." - instead, say "yes, that is alright" or "yes, I understand."

2. "Yeah" - instead, say "Yes."

3. "Ya know," - instead, say "do you know," or "do you understand?"

VI. Summary and Conclusion

A. Answering phone calls

B. Taking a message

C. Termination of phone calls

D. Effective telephone techniques

E. Ineffective telephone techniques

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IV BASIC TELEPHONE TECHNIQUES

INTERACTION ITEMS: (Review Items)

1. Why is it important to smile and exhibit a positive and professional attitude answering the phone, no matter what is happening at the time?

2. What are some of the irritating things that people in a business have done to you when you spoke on the telephone to them for business purposes?

CLASSROOM, LABORATORY OR OTHER ACTIVITIES:

1. Using two phones, role-play the following:

   a. An irritated caller wants to talk to the doctor and does not really want to be put off.

   b. An attorney or insurance agent has called to ask about the patient's diagnostic report and how many procedures were done.

   c. A patient calls asking that you recommend the best doctor to visit for a particular problem.

   d. A person calls and wants to tell you at length about her/his illness and the many exams that she/he has had, and will be having and, and, and, and, etc.

   e. Someone calls asking for the cost of a procedure.

2. See if the class can come up with additional slang or phrases to be avoided when processing a telephone call. Determine the correct, professional version of the same thing.

3. Practice answering the phone. See who sounds the most professional and positive. Students will be able to hear different styles this way and perhaps get the opinion of other students in class about the way they sound on the phone and the effectiveness of the techniques that they use.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IV BASIC TELEPHONE TECHNIQUES

EVALUATION ITEMS:

1. List two criteria for answering the telephone in a business or professional setting.

   a.

   b.

2. List three steps in recording a phone message.

   a.

   b.

   c.

3. How should you properly terminate a telephone conversation? (Circle the letter of the best answer.)

   a. Hang up on the caller before he/she has finished talking.

   b. Say "Good-bye" and hang up.

   c. Tell the caller that he/she should try to come in person the next time, since you do not have time to keep answering the phone.

   d. Let the caller know that you are interested in him/her as a person by saying, "Thank you, Mr./Mrs./Ms. _____, for calling. If there is anything else I can help you with in the future, please let me know." Then wait for the caller to hang up.

   e. Tell them you are sorry you cannot talk longer but you have to go now because you are busy. Thank them for calling and say, "Have a nice day."

The following statements are examples of telephone techniques. Place the letter "I" in the blank if the statement is an example of an ineffective telephone technique or the letter "E" if it is an example of an effective telephone technique.

_____ 4. Wait until the phone rings at least twice before you answer it.

_____ 5. If someone has a message to give you, tell them to hold until you can find a pencil or pen to write with.

_____ 6. If you are making several outgoing calls, space them several minutes apart so that people calling in will not keep getting a busy signal.

_____ 7. If you are too busy to talk, tell the person to call back later.

_____ 8. Repeat the caller's name, Mr./Mrs./Ms. _____, in the conversation.

Write a short answer to each of the following situations.

9. A patient's attorney calls and states that he/she is preparing for a hearing and is scheduled for court tomorrow. He/she needs the list of exams that were completed on his/her client the previous week. How would you respond to this request?

10. Someone calls and demands to talk to the doctor immediately. The doctor is with a patient. The caller is getting increasingly irritated. How would you handle such a call?

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IV BASIC TELEPHONE TECHNIQUES

ANSWERS TO EVALUATION ITEMS:

1. Any two of the following:

   a. Answer the phone on the first ring, if possible.
   b. Identify the department or office by name.
   c. Identify yourself by your first and last name.
   d. Follow up with an appropriate phrase like "How may I help you?"
   e. Find a pencil and piece of paper as you are starting the conversation and introducing yourself. "This is the _____ department; _____ speaking, may I help you?" By this time, you should have located a note pad and pencil or pen.
   f. Display courtesy
      1. Use a natural and sincere manner of speaking.
      2. Use a friendly tone of voice.
      3. Develop the attitude that you want to help other people. This positive attitude will come across on the phone.
      4. Do not use standard phrases like "have a nice day" over and over again for every caller. Say something original that is appropriate to the person calling.

2. a. Determine the purpose of the call by listening to the caller and asking questions for clarification.
   b. Obtain information by asking the caller's name and phone number if he/she is leaving a message or making an appointment.
   c. Clarify the information by repeating in the message back to the caller to make sure it is accurate.

3. d
4. I
5. I
6. E
7. I
8. E

9. Answers will vary, but should point out that the confidential nature of such information does not allow the person answering the phone to discuss the patient's examinations over the phone. This would require the attorney to have a release form signed by the patient.

10. Answers will vary but should state that the correct way to handle this situation would be to calmly explain that the doctor is presently with another patient but can return the call later. Take the caller's name and number, reading the information back for verification, then ask if there is anything else you can do to help.

TELEPHONE TECHNIQUES FOR THE HEALTH PROFESSIONAL

The health professional must have a thorough knowledge of how to use the telephone. Never underestimate the importance of projecting a positive, professional image through your telephone personality. Remember, the person calling cannot see you. He/she can only judge you by how you sound. Everything depends on your voice and good telephone manners.

ANSWERING THE CALL AND MAKING A CALL:

There is a great difference between telephone conversation and face-to-face conversation. The friendly smile, congenial personality, and warm gestures are not possible when the meeting is by telephone.

Positive voice-to-voice meetings are created by the natural and sincere manner in which you speak. Avoid words or repetitious phrases that give the impression of insincerity. It is essential to give prospective and regular patients personal attention.

In your role as respiratory therapy aide, you have many opportunities to relieve your employer of details and protect his/her prestige. Your job is doubly important on the telephone because you are representing a business. An employer depends on a receptionist to intercept and screen calls, and in many cases, handle the call rather than interrupt the doctor or other practitioner. No matter what the situation, you should always be pleasant, tactful, and diplomatic.

THE THREE PARTS OF THE TELEPHONE CALL:

1. Identification (Introduction)

    a. Answer promptly. Make the first impression a favorable one by answering on the first ring.
    b. Proper identification is needed. Identify yourself and your place of work. It is important to let the caller know that he or she has reached the right person.
    c. Answer in the manner which your employer wishes you to, usually by saying, "This is the _____ department; _____ speaking, may I help you?"
    d. Answering with a number is frowned upon. People do NOT like to talk to a number (i.e., "This is extension 671.").
    e. Establish a courteous and friendly attitude.
    f. Be prepared to take messages by having a pencil and note pad available.

2. Body of the Call (Purpose)

    a. Always obtain the caller's name and telephone number.
    b. If the caller is a new client/patient ask who referred him/her.

c. Never use the term "cancellation." It has a negative and harsh connotation. Instead of "We have a cancellation," say, "We can get you in at. . ."
d. When taking a message, be accurate. Repeat the information to the caller to assure him/her that you have the correct information.
e. If the caller is a new client/patient, obtain address, phone number of home and business, and correct spelling of his/her name.

3. Termination (Conclusion)

a. End the call in a sincere and agreeable manner.
b. Let the caller know you were glad to be of service.
c. Let the caller hang up first.

HOLDING THE TELEPHONE

1. Hold the telephone mouthpiece one-half to one inch away from your lips. Your voice is carried more clearly by the telephone if you hold the transmitter close to your mouth and speak directly into the phone. A good rule is: if two fingers are placed against the mouthpiece and your lips against the fingers, even a hard of hearing person is able to hear due to the vibrations of the transmitter. It is never necessary to shout into the telephone.

2. Never have anything in your mouth. Do not chew on a pencil or gum and avoid smoking when you are talking on a telephone.

INEFFECTIVE TELEPHONE TECHNIQUES

1. Never say "hello" without also providing proper identification.

2. Never demand information. Ask for information in a courteous manner.

3. Never give out information that may damage the employer's image.

4. Never contradict a patient directly.

5. Never discuss the habits or problems of one patient with another.

6. Never say no to an emergency.

7. Never use the term "okay" or other slang terms.

8. Never lose poise or become angry.

9. Never use the business phone for personal business.

EFFECTIVE TELEPHONE TECHNIQUES

1. Answer promptly.

2. Be prepared to take a message.

3. Be courteous even if the caller is discourteous.

4. Repeat the caller's name frequently; people like to hear their own name.

5. Space outgoing calls to allow incoming calls to come through.

6. Retain the initiative. Learn when and how to cut off long-winded patients tactfully.

7. If more than one line is ringing and you must ask the caller to hold, take the name and telephone number of the second caller as quickly as possible and return to the first caller, apologizing for the delay.

8. If necessary, have the patient's file containing history, x-rays and other information at hand. You will sound prepared, and the call will be handled much more efficiently.

9. Screen calls in a businesslike manner.

10. If it is necessary to leave the phone, be sure to tell the person on the phone how long you will be gone. Upon returning, greet him/her by name and if there was an unavoidable delay, apologize.

11. Speak distinctly and unhurriedly.

Remember, the closing is an important part of the telephone call. Always end your conversations with a few pleasant words: "Thank you for calling," "It's good to speak to you again," or "I'm so glad you called that to my attention." By learning and practicing these techniques, you will make the most of a few moments of personal contact between you and someone who needs your help. You will look, sound, and feel professional.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT V CLINICAL PROCEDURES AND THERAPEUTIC DELIVERY METHODS

SCOPE OF UNIT:

This unit will familiarize the student with the procedures and various therapeutic delivery methods typically found in respiratory therapy departments. The range of services offered depends on the size of the hospital (which determines the size of the R.T. department) and the type of hospital (acute care or community hospital). Each R.T. department has a procedure manual that lists the services provided and gives detailed instructions for delivering various therapies to patients requiring respiratory care.

INFORMATION TOPIC: X OR DEMONSTRATION:

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. List three indications for oxygen therapy.
2. List two indications for aerosol and humidity administration.
3. Describe the rationale for lung expansion therapy.
4. List two indications for the use of chest percussion/chest physiotherapy.
5. List two indications for naso-tracheal suctioning.
6. List four general categories of diagnostic and patient monitoring procedures.
7. List five goals of pulmonary rehabilitation and patient education.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

1. Selected abbreviated copies of respiratory therapy procedure manuals

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

Burton, George and John E. Hodgin Respiratory Care: A Guide to Clinical Practice. 2nd ed. Philadelphia: J.B. Lippincott Co., 1984.

INTRODUCTION:

The scope of services a typical respiratory therapy department offers depends on several factors. Local and regional variations exist in the manner in which respiratory therapy is practiced. This unit describes some of the most commonly performed therapies.

As an aide in respiratory therapy, you must be acquainted with the indications for therapies and procedures, not to the point of actually performing them, but to understand the goal of selected therapies and/or procedures.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT V CLINICAL PROCEDURES AND THERAPEUTIC DELIVERY METHODS

OUTLINE: (Key Points)

I. Therapeutic Gas Administration

A. Procedures involving the delivery of a gas (usually oxygen) or a mixture of gases having some therapeutic effect or outcome

B. Indications for oxygen therapy (II-1)

1. To treat hypoxia

2. To decrease the work of the respiratory system

3. To decrease the work of the heart

C. Indications for carbon dioxide-oxygen therapy

1. To stimulate the respiratory centers in patients with decreased depth of breathing (hypopnea)

2. Administered to stroke victims to increase cerebral blood flow in the brain (somewhat controversial)

II. Aerosol and Humidity Administration

A. Medical gases in dry form, such as oxygen, are piped into the hospital in tanks and cylinders. Before these gases can be administered to a patient, they must be humidified.

B. Indications for aerosol administration

1. To hydrate the mucosal membrane and prevent retention of secretions and reduced efficiency of the cilia, which could lead to harmful changes in the lining of the airway

2. To increase the humidity in postsurgical patients who have an artificial airway

III. Lung Expansion Therapy

A. Used for patients who cannot or are unwilling to take deep breaths due to pain, surgery, slow recovery from anesthetics, or neuromuscular disease. Two devices, incentive spirometry and intermittent positive pressure breathing (IPPB), are used to provide lung expansion assistance.

B. Indications for incentive spirometry

1. To instruct patients preoperatively on the importance of deep breathing after surgery

2. To prevent or reverse atelectasis

C. Indications for IPPB apparatus

1. To prevent or treat atelectasis

2. To aid in the removal of secretions

3. In some cases, to deliver medications to those patients who cannot or are unwilling to breathe deeply

4. Should be used if incentive spirometry does not meet patient needs

IV. Chest Physiotherapy

A. A group of procedures used to improve bronchial hygiene and promote optimal breathing patterns. These techniques can help mobilize secretions and assist the patient in their removal.

B. Indications for chest percussion and postural drainage

1. Excessive, thick bronchial secretions due to a disease process (cystic fibrosis or pneumonia)

2. Inability to effectively produce a cough, due to neuromuscular disease origin, postsurgical case, or chronic disease

C. Indications for diaphragmatic breathing

1. For the patient with chronic lung disease who, because of the disease, no longer uses the diaphragm

2. Retraining the diaphragm would reduce the amount of trapped gas in the lung and would restore optimal ventilation and breathing patterns.

V. Airway Care

A. Indications for naso-tracheal suctioning

1. To aid in the removal of secretions from the airway

2. For those patients who cannot effectively produce a cough (neuromuscular disease, overdose, or coma)

B. Indications for tracheostomy care - presence of secretions and other material around the tracheal opening

VI. Diagnostic and Patient Monitoring Procedures

A. Indications for arterial blood gas analysis

1. To assess a patient's ventilatory status

2. To assess oxygenation status

3. To monitor patient's status

B. Indications for the use of bronchoscopy

1. Bronchial obstruction

2. To evaluate of lesions within the respiratory tract

3. Patients with hemoptysis

4. Preoperative evaluation

5. Foreign body aspiration

6. Lower respiratory tract suctioning

7. To obtain biopsy for bacteriologic or pathologic examination

C. Indications for pulmonary function tests

1. To determine the presence of lung disease

2. To assess extent of abnormality

3. To assess extent of disability

4. To assess progression and type of disease

D. Indications for exercise testing

1. To determine a patient's capacity for work

2. To determine a patient's maximum oxygen uptake

3. To determine a patient's level of endurance

4. To develop an exercise prescription as part of an overall rehabilitation program

VII. Goals of Pulmonary Rehabilitation and Patient Education (II-2)

A. To decrease work of breathing

B. To improve exercise tolerance

C. To provide instruction in bronchopulmonary hygiene

D. To decrease frequency and/or severity of hospitalization

E. To provide information to patient about his/her respiratory disease

F. To improve self-concept

G. To provide social support and self-help groups

H. To improve independence in daily living

I. To assist in smoking cessation

VIII. Summary and Conclusion

A. Therapeutic gas administration

B. Aerosol and humidity administration

C. Lung expansion therapy

D. Chest physiotherapy

E. Airway care

F. Diagnostic and patient monitoring procedures

G. Goals of pulmonary rehabilitation and patient education

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT V CLINICAL PROCEDURES AND THERAPEUTIC DELIVERY METHODS

INTERACTION ITEMS: (Review Items)

1. What are the indications for giving a patient oxygen?
2. What are the goals of a pulmonary rehabilitation program?

CLASSROOM, LABORATORY OR OTHER ACTIVITIES:

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT V CLINICAL PROCEDURES AND THERAPEUTIC DELIVERY METHODS

EVALUATION ITEMS:

1. List three indications for oxygen therapy.

   a.

   b.

   c.

2. List two indications for aerosol and humidity administration.

   a.

   b.

3. Describe the rationale for using lung expansion therapy.

4. What are two indications for chest percussion/chest physiotherapy?

   a.

   b.

5. List two indications for naso-tracheal suctioning.

   a.

   b.

6. List the four general categories of diagnostic and patient monitoring procedures.

   a.

   b.

   c.

   d.

7. List five goals of a pulmonary rehabilitation and patient education program.

a.

b.

c.

d.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT V CLINICAL PROCEDURES AND THERAPEUTIC DELIVERY METHODS

ANSWERS TO EVALUATION ITEMS:

1. a. To treat hypoxia
   b. To decrease the work of the respiratory system
   c. To decrease the work of the heart

2. a. To hydrate the mucosal membrane and prevent retention of secretions and reduced efficiency of the cilia, which could lead to harmful changes in the lining of the airway.
   b. To increase the amount of humidity in patients requiring additional humidity, such as postsurgical patients with artificial airways

3. It is used for patients who are not willing or cannot take deep breaths due to pain, surgery, postoperative anesthesia, or neuromuscular disease.

4. a. Excessive, thick bronchial secretions from a disease or pneumonia
   b. Inability of a patient to effectively produce a cough due to chronic or acute disease

5. a. To aid in the removal of secretions from the airway
   b. For those patients who cannot effectively produce a cough because of neuromuscular disease, overdose, and coma

6. a. Indications for arterial blood gas analysis
   b. Indications for use of bronchoscopy
   c. Indications for pulmonary function tests
   d. Indications for exercise testing

7. a. Improve exercise tolerance
   b. Decrease hospitalization
   c. Improve self-concept
   d. Provide information and education regarding patient's disease
   e. Improve independence in daily living

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VI EQUIPMENT IDENTIFICATION AND CLEANING

SCOPE OF UNIT:

This unit will acquaint the student with equipment used in respiratory therapy. Discussion of when various equipment is used, conditions of use and basic principles of operation will be presented. Also, the correct equipment cleaning procedures will be covered.

INFORMATION TOPIC: X OR DEMONSTRATION

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. Identify the basic functions of the various types of respiratory therapy equipment.
2. List seven steps involved with attaching a regulator to an oxygen cylinder.
3. List three steps involved with attaching a flowmeter to a wall outlet.
4. State the difference between a humidifier and a nebulizer.
5. Identify the characteristics of the various oxygen delivery devices.
6. Describe the correct procedure for cleaning respiratory therapy equipment prior to sterilization/disinfection.
7. Match four sterilization/disinfection techniques with their definitions.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

1. HO 1: Flowmeters
2. HO 2: Humidifying Devices
3. HO 3: Oxygen Delivery Devices
4. HO 4: Airways
5. HO 5: Other Respiratory Therapy Equipment

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

Burton, George and John E. Hodgkin Respiratory Care: A Guide to Clinical Practice. 2nd ed. Philadelphia: J.B. Lippincott Co., 1984.

INTRODUCTION:

The foundation of respiratory therapy is equipment. No other allied health profession is so closely involved in providing patient care through the use of mechanical devices. In the words of Dr. William F. Miller, "Let there be no doubt, respiratory therapy is largely a mechanical therapy."

The respiratory therapy aide has a major responsibility in keeping the equipment cleaned, properly assembled, and available for use. However, before you gain any hands-on experience in equipment cleaning, you will need to become familiar with and fully comprehend the function and purpose of various types of respiratory therapy equipment.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VI EQUIPMENT IDENTIFICATION AND CLEANING

OUTLINE: (Key Points)

I. Pressure Regulators (II-1)

A. Used to reduce cylinder pressure to a safe operating level, usually 50 pounds per square inch (50 psi)

B. Types of pressure-reducing regulators

1. Bourdon tube type

a. Most common

b. Flow rate from regulator can be reduced (compared to the flowmeter reading) as resistance is increased downstream from regulator.

2. Thorpe tube type

a. Most are pressure-compensated

b. Flow rates are not affected when resistance is added downstream, giving accurate reading of flowrate.

C. Attaching regulator to cylinder

NOTE: Follow the recommended steps for handling and tranporting medical gas cylinders in Unit VII. Crack cylinder to remove any debris prior to attaching regulator.

1. Insert regulator inlet into cylinder valve outlet and tighten with wrench.

2. Loosen regulator flow-adjusting handle (with Bourdon tube type).

3. Close flow-adjusting valve (with Thorpe tube type).

4. Stand to one side of regulator and open cylinder valve until needle on pressure gauge stops.

5. Open flow-adjusting valve with Bourdon tube type until flow reaches indicated flow rate.

6. Turn flow-adjusting handle until desired flow rate is reached on indicator gauge.

7. Reverse procedure for each type if removal of regulator from cylinder is desired.

8. Replace cap.

II. Flowmeters (HO 1) (II-2)

A. Used to control and measure amount of oxygen going to a patient

B. Parts of a flowmeter

1. Calibrated tube that indicates flow rate in liters per minute (lpm)

2. Needle valve to control rate of flow leaving meter

C. Types of flowmeters

1. Pressure-compensated (usually a Thorpe tube type)-not affected by back pressure; actual flow rate and the flowmeter reading are the same

2. Non-compensated or uncompensated (usually a Bourdon tube type) affected by back pressure; actual flow rate may be less than reading on the flowmeter

D. Attaching flowmeter to wall outlet

1. Close flow-adjusting valve on flowmeter.

2. Insert flowmeter into wall outlet until a firm connection is made.

3. Open flow-adjusting valve on flowmeter until desired flow is reached.

E. Disconnecting the flowmeter

1. Turn flow-adjusting valve in opposite direction.

2. Gently push flowmeter into wall outlet; flowmeter will then come out.

III. Humidifying Devices (HO 2) (II-3)

A. Used to humidify dry medical gas (usually oxygen) as it comes from cylinder or master pipeline system

B. Humidifiers

1. Devices for passing medical gas through sterile water so that water vapor is picked up

2. Ability of humidifiers to produce an adequate amount of water vapor is dependent on:

a. Temperature

b. Surface area of water

c. Time in contact with the water

C. Nebulizers

1. Devices that produce an aerosol (suspension of fine particles or droplets in a gas)

2. Aerosol is produced by a fine jet stream of oxygen coming into contact with water at a 90 degree angle. Gas and water are forced against a baffle where solution is broken up into aerosol particles.

IV. Oxygen Delivery Devices (HO 3)

A. Designed to deliver oxygen to patients by various methods.

B. Tracheostomy collar-used in conjunction with high-humidity aerosol therapy for patients with tracheostomy

C. Nasal cannula

1. Administers oxygen at low concentrations (22-30%), at 1-6 lpm

2. When used with extension tubing; can be used with patients who are ambulatory

D. Nasal catheter (II-4)

1. Hollow, plastic tube inserted into patient's nostril and advanced until tip of catheter is in back of pharynx

2. Used to deliver moderate concentrations of oxygen (30-35%) at 1-6 lpm

E. Simple oxygen mask

1. Consists of a mask without valves that fits over patient's nose and mouth

2. Used to deliver oxygen concentrations of 40 to 60% at 5-8 lpm

F. Partial rebreathing mask and bag

1. Used to deliver high concentrations of oxygen (60-90%) at liter flows high enough to keep bag from collapsing as patient inspires

2. About one-third of patient's expired gas enters the bag and is rebreathed, which provides stable oxygen concentrations

G. Nonrebreathing mask and bag

1. Similar to the partial rebreathing mask and bag except one-way valve is inserted and the only gas the patient breathes comes from bag. Patient does not rebreathe any of own gas.

2. Used to deliver high concentrations of oxygen (greater than 90%)

H. Venturi mask

1. Used when precise concentrations of oxygen are required

2. Concentrations available are 24%, 28%, 35%, and 40%

I. Aerosol tee adapter

1. Used in conjunction with large-reservoir nebulizer aerosol therapy

2. Used on patients who have been intubated or tracheostomized

J. Aerosol mask or face tent

1. Used in conjunction with large-reservoir nebulizer aerosol therapy; fits over the nose and mouth

2. Oxygen concentrations are set on nebulizer; liter flow rates are high enough to ensure stable concentrations

K. Oxygen hoods

1. Plastic enclosures designed to fit over an infant's head for purpose of delivering oxygen and/or humidity

2. Greater precision can be achieved than by enclosing infant in tent or incubator

L. Oxygen tent

1. System that provides environmental control of

   a. Oxygen concentration

   b. Temperature

   c. Humidity/aerosol

   d. Filtered gas

2. Oxygen concentration is a function of incoming flow, tent canopy volume, and degree the tent is sealed properly around bed.

   a. Temperature is controlled by using ice or refrigeration systems using a fluid coolant like Freon

   b. Aerosol added by either pneumatic nebulizer or ultrasonic nebulizer

3. Filtered environment is accomplished by drawing all incoming gas through various filtering devices

M. Incubators

1. Environmental systems designed to provide control of

a. Temperature

b. Oxygen concentration

c. Humidity

d. Filtered gas environment

2. Function same as tents, except temperature control is for heating instead of cooling

3. Provide tighter seal than tents

4. Most often used for infants less than 3 months old

V. Airways (HO 4)

A. Designed for patients who cannot maintain a patent airway

B. Nasopharyngeal airways

1. Hollow, curved, soft plastic or rubber tube inserted into nasal passage

2. Used for patients who cannot tolerate an oral airway

3. Helpful with patients who require frequent suctioning; prevents damage to nasal mucosa during suctioning

C. Oropharyngeal airway

1. Hollow, S-shaped plastic or rubber tube inserted into the oral cavity over the tongue

2. Prevents the tongue from slipping back and obstructing airway

3. Helpful with comatose patients who require a patent airway

4. Conscious patients will not tolerate this type of airway.

D. Esophageal obturator airway

1. Curved tube with closed, cuffed end inserted into esophagus

2. Several holes are placed above cuff to allow air flow.

3. Cuff is inflated and pressure applied to tube by mask that covers nose and mouth.

4. Cuff and plugged end of tube prevent air from entering stomach.

5. Used during emergency requiring a patent airway for ventilation

VI. Manual Resuscitators (HO 5) (II-5)

A. Commonly used to provide artificial ventilation for patients who are unable to breathe spontaneously

B. Incorporate self-inflating bag and nonrebreathing valve assembly.

C. Purpose is to apply positive pressure (ventilation) to the airway

D. Oxygen (concentration may vary) can be delivered via resuscitator by

1. Placing mask over patient's nose and mouth

2. Inserting endotracheal tube into patient's trachea

VII. Oxygen Analyzers (HO 5)

A. Used to monitor concentration of oxygen administered to patient

B. Measure oxygen concentration in incubator air

C. Measure oxygen in inspiratory air delivered by mechanical ventilators

VIII. Volume Collection Devices (Spirometers) (II-6)

A. Used to obtain data about lung function

B. Used primarily in patients who have lung impairment

C. Simple spirometer consists of a bell, bellows, and moving piston (for volume displacement).

IX. Pressure Preset Respirators

A. Used to deliver positive pressure ventilation

B. For treatment purposes

C. For short-term continuous mechanical ventilation

D. Pneumatically (gas) powered, pressure limited, patient cycled

X. Incentive Devices

A. Equipment and techniques used to encourage patients to take deep inspirations and sustain them for a period of time

B. For preoperative instruction for patients undergoing general surgery

C. For prevention and/or reversal of atelectasis

XI. Continuous Mechanical Ventilators (II-7)

A. Interim life support system

B. Not therapeutic; maintenance system allowing health care team to correct the patient's medical problem

C. Two basic categories of ventilators

1. Pressure limited

2. Volume limited

XII. Equipment Cleaning

A. Regardless of what method is used for disinfection or sterilization, all equipment must be thoroughly cleaned. First step is to remove dried secretion, blood and other substances that may adhere to equipment surface.

B. Prepare equipment

1. Wear gloves.

2. Discard any disposable equipment.

3. Disassemble equipment down to its smallest components.

C. Wash items that can be placed under water in a hot detergent and scrub to remove any debris.

D. Rinse equipment to remove all soap.

E. If equipment is to be sterilized, place it in drying cabinet before packaging.

XIII. Equipment Sterilization and Disinfection (II-8)

A. Chemical disinfection - process in which bacteria are killed by immersing contaminated equipment into a liquid disinfectant (i.e., Cidex)

B. Pasteurization - process in which equipment is disinfected by immersing it in hot water (170 degrees F) for a given time interval (usually 30 minutes); spores are not killed

C. Steam autoclave sterilization - process which utilizes pressurized steam to kill all microorganisms; some equipment cannot tolerate these high temperatures and pressures

D. Ethylene oxide sterilization - use of the chemical ethylene oxide. This method is highly effective; however, this gas is also very toxic. Adequate aeration is necessary to avoid causing skin rashes and other lesions.

XIV. Summary and Conclusion

A. Pressure regulators

B. Flowmeters

C. Humidifying devices

D. Oxygen delivery devices

E. Airways

F. Manual resuscitators

G. Oxygen analyzers

H. Volume collection devices

I. Pressure preset respirators

J. Incentive devices

K. Continuous mechanical ventilators

L. Equipment cleaning

M. Equipment sterilization and disinfection

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VI EQUIPMENT IDENTIFICATION AND CLEANING

INTERACTION ITEMS: (Review Items)

1. What are pressure reducing regulators? Can you explain how to attach a regulator to a cylinder?
2. What is a flowmeter used for? What is meant by the term "pressure compensated?"
3. Can you explain the difference between a humidifier and a nebulizer?
4. What is a nasal cannula used for? A simple oxygen mask? Can you state the approximate oxygen percentage each is used to deliver?
5. What are manual resuscitators used for?
6. What is the purpose of volume collection devices? Can you give an example of when you would use one?
7. Why is cleaning respiratory therapy equipment prior to disinfection or sterilization necessary?
8. What is the difference between chemical disinfection and steam autoclave?

CLASSROOM, LABORATORY, OR OTHER ACTIVITIES:

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VI EQUIPMENT IDENTIFICATION AND CLEANING

EVALUATION ITEMS:

Match the following types of respiratory therapy equipment with their descriptions:

a. Pressure preset respirators
b. Manual resuscitators
c. Oxygen analyzers
d. Continuous mechanical ventilators
e. Airways
f. Incentive devices
g. Flowmeters
h. Pressure regulators
i. Oxygen delivery devices
j. Humidifying devices
k. Volume collection devices (spirometers)

_____ 1. Designed to deliver oxygen to patients by various methods

_____ 2. Used to monitor the concentration of oxygen being administered to a patient

_____ 3. Used to obtain data on lung function, usually in lung-impaired patients

_____ 4. Used to provide artificial ventilation for patients who are unable to breathe spontaneously

_____ 5. Used to reduce cylinder pressure to a safe level, usually 50 psi

_____ 6. Designed for patients who cannot maintain a patent airway

_____ 7. Equipment and techniques designed to encourage patients to take deep inspirations and sustain them for a period of time

_____ 8. Interim life support system

_____ 9. Used to humidify dry medical gas (usually oxygen) as it comes from the cylinder or master pipeline system

_____ 10. Used to control and measure the amount of oxygen going to a patient

_____ 11. Used to deliver positive pressure ventilation for treatment purposes and for short-term continuous ventilation

24. List the seven steps involved in attaching a regulator to an oxygen cylinder.

a.

b.

c.

d.

e.

f.

g.

25. List the three steps involved in attaching a flowmeter to a wall outlet.

a.

b.

c.

26. State the difference between a humidifier and a nebulizer.

27. Describe the correct procedure for cleaning respiratory therapy equipment that is to be sterilized or disinfected.

a.

(1)

(2)

(3)

b.

c.

d.

28. Match the following definitions with the correct types of sterilization/disinfection techniques.

_____	a.	Process by which equipment is disinfected by immersing into hot water (170 degrees F) for a given time interval	1. Chemical disinfection
_____	b.	Process using a pressurized system to kill all micro-organisms	2. Pasteurization
_____	c.	Process by which bacteria are killed by immersing equipment into a liquid disinfectant	3. Steam autoclave
_____	d.	Process of sterilization using a chemical gas	4. Ethylene oxide sterilization

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VI EQUIPMENT IDENTIFICATION AND CLEANING

ANSWERS TO EVALUATION ITEMS:

1. i
2. c
3. k
4. b
5. h
6. e
7. f
8. d
9. j
10. g
11. a

12. k
13. h
14. e
15. g
16. a
17. i
18. d
19. b
20. c
21. l
22. j
23. f

24. a. Insert regulator inlet into cylinder valve outlet and tighten with wrench.
    b. Loosen regulator flow-adjusting handle (on Bourdon tube type).
    c. Close flow-adjusting valve (on Thorpe tube type).
    d. Stand to one side of regulator and open cylinder valve until needle on pressure gauge stops.
    e. Open the flow-adjusting valve (on Bourdon tube type) until flow reaches indicated flow rate.
    f. Turn flow-adjusting handle until desired flow rate is reached on indicator gauge.
    g. Reverse procedure for each type if reversal of regulator from cyclinder is desired.

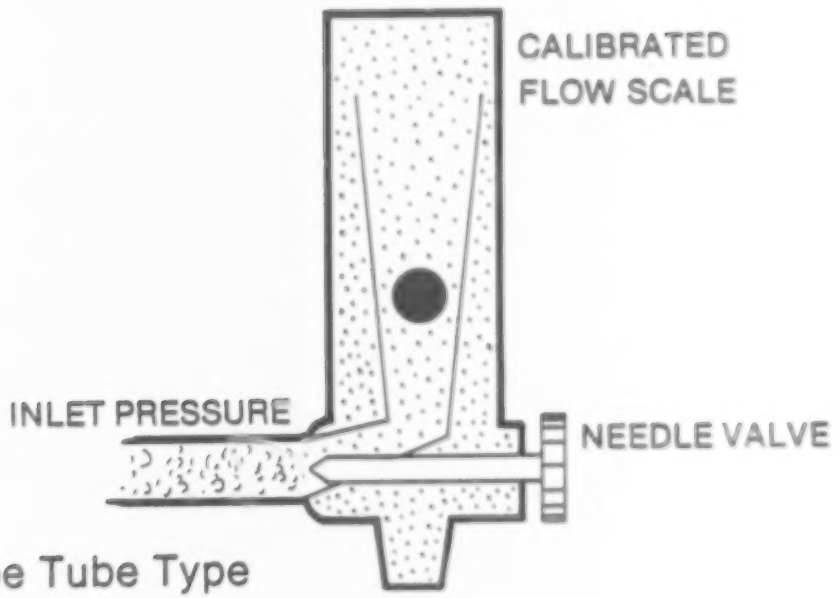
25. a. Close flow-adjusting valve on flowmeter.
    b. Insert flowmeter into wall outlet until a firm connection is made.
    c. Open flow-adjusting valve on flowmeter until desired flow is reached.

26. A humidifier passes oxygen or other gas through sterile water so that water vapor is picked up. A nebulizer shoots a fine jet stream of oxygen into water at a 90 degree angle. The gas and water are then forced against a baffle, breaking the solution into aerosol particles.

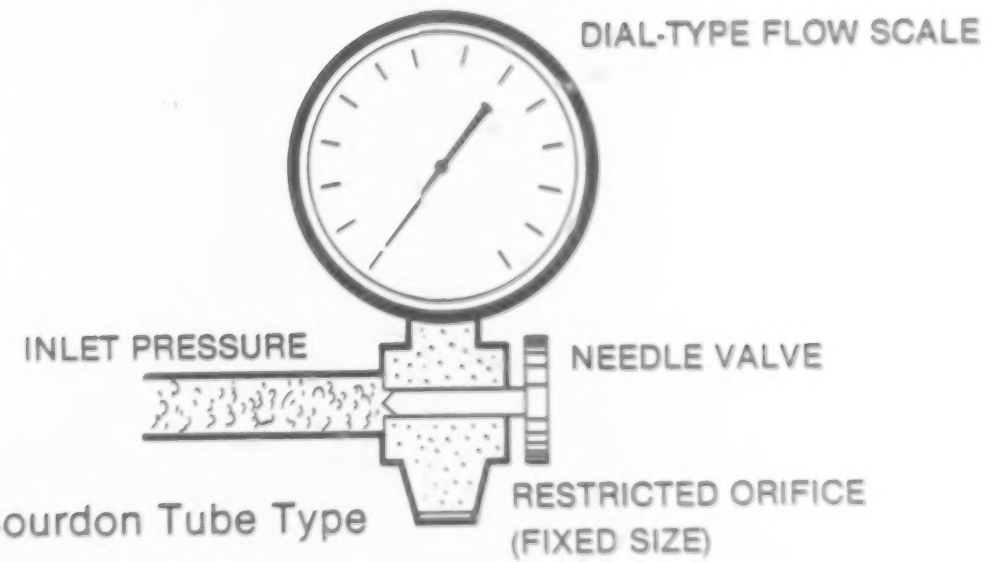
27. a. Prepare equipment
    (1) Wear gloves.
    (2) Discard any disposable equipment.
    (3) Disassemble equipment down to its small components.
    b. Wash items that can be placed under water in hot detergent and scrub to remove debris.
    c. Rinse equipment to remove all soap.
    d. If equipment is to be sterilized, place it in a drying cabinet before packaging.

28. a. 2
    b. 3
    c. 1
    d. 4

Flowmeters

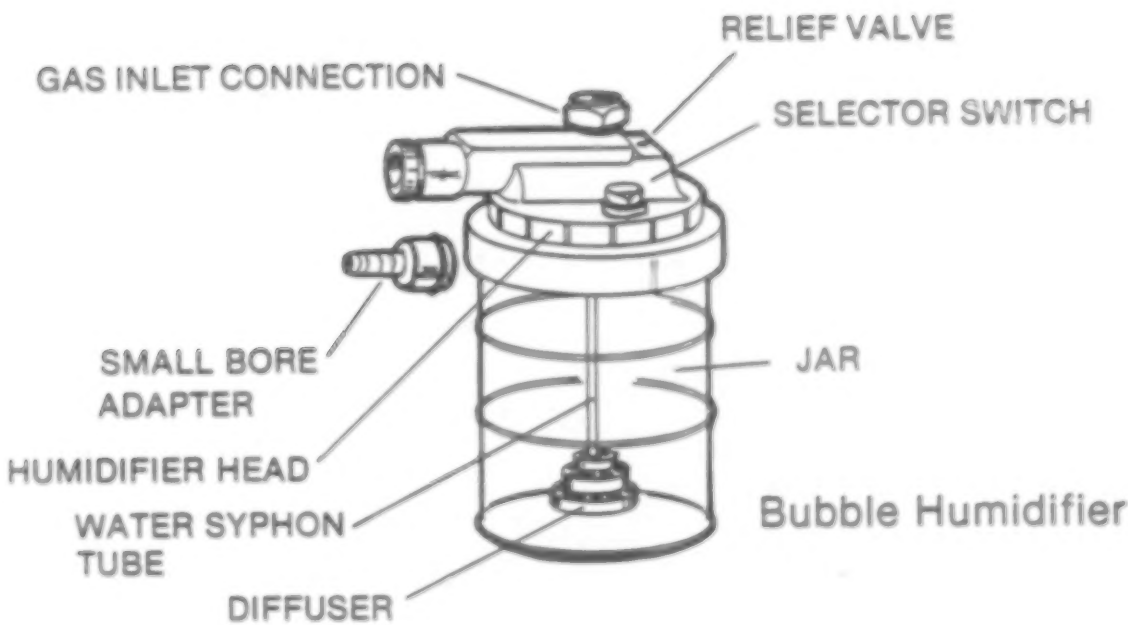


Thorpe Tube Type

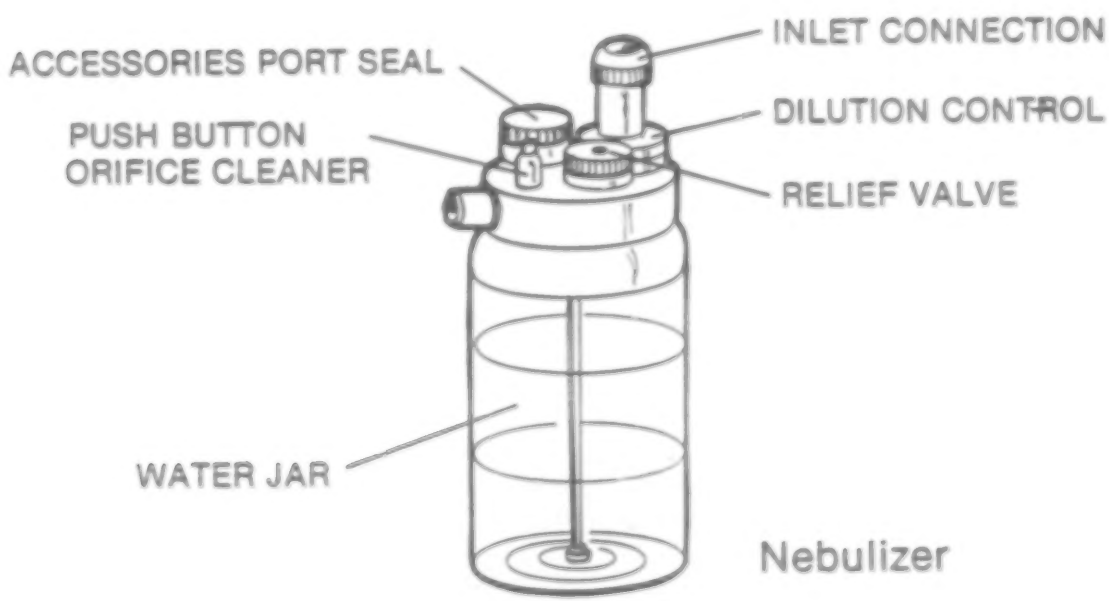


Bourdon Tube Type

Humidifying Devices

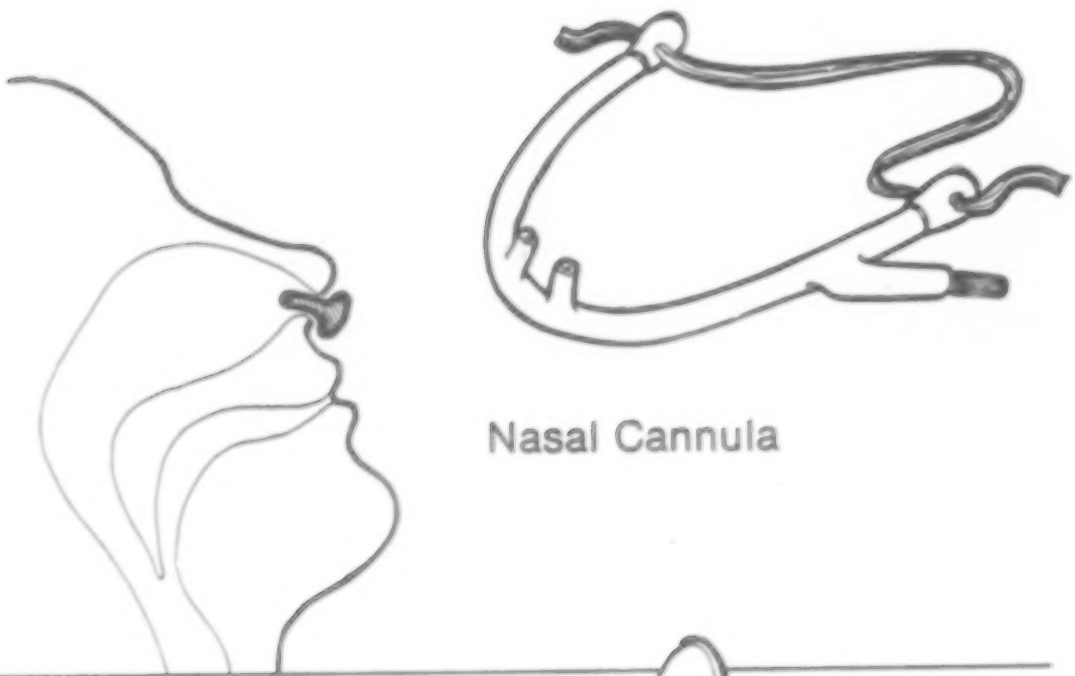


Bubble Humidifier



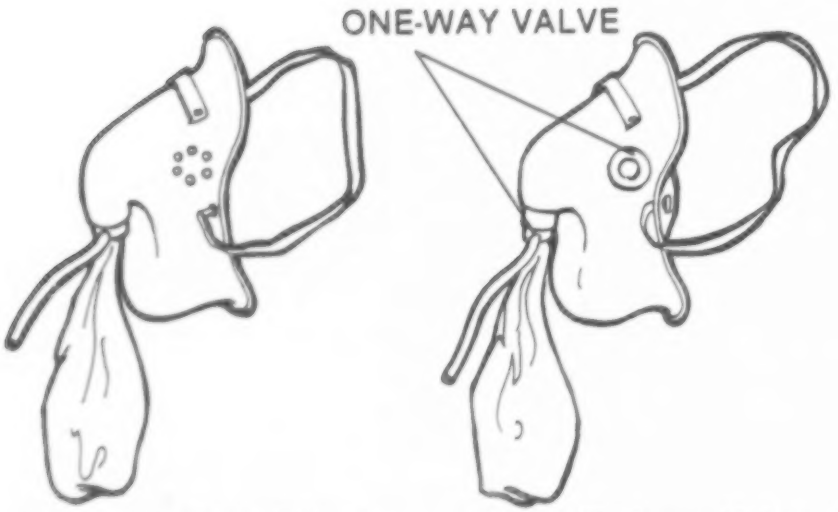
Nebulizer

Oxygen Delivery Devices



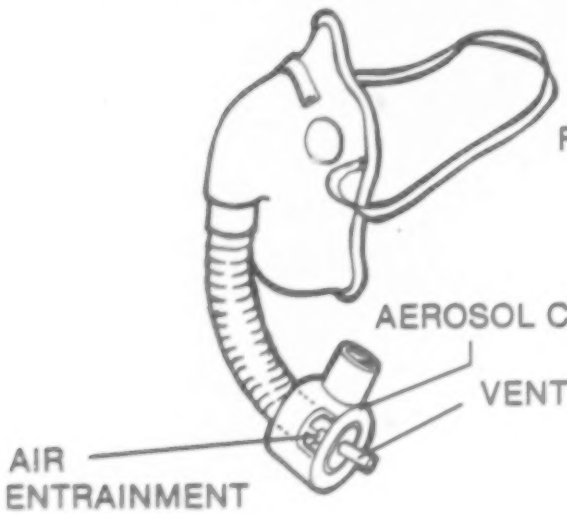
Nasal Cannula

Simple Oxygen Mask

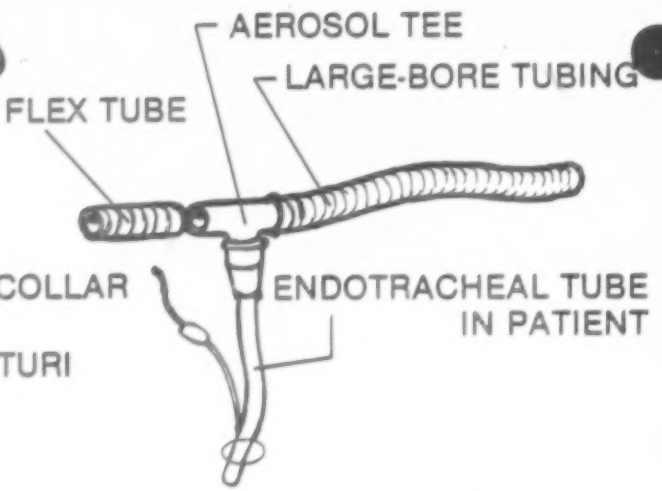


Partial Rebreathing Mask

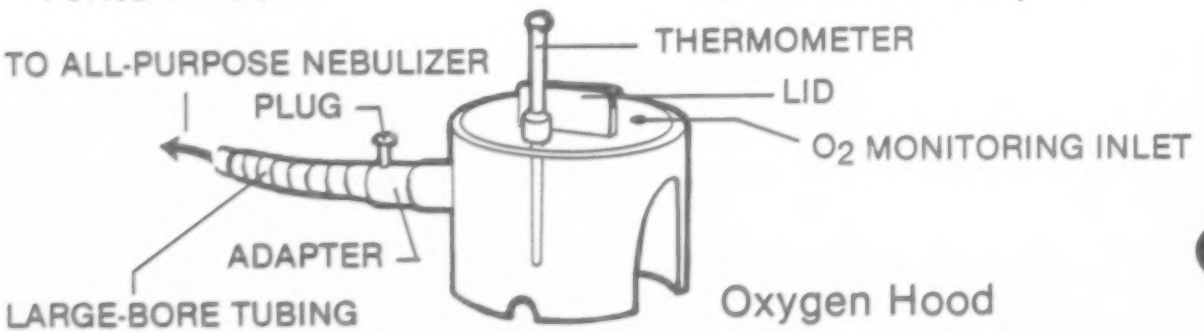
Non-Rebreathing Mask



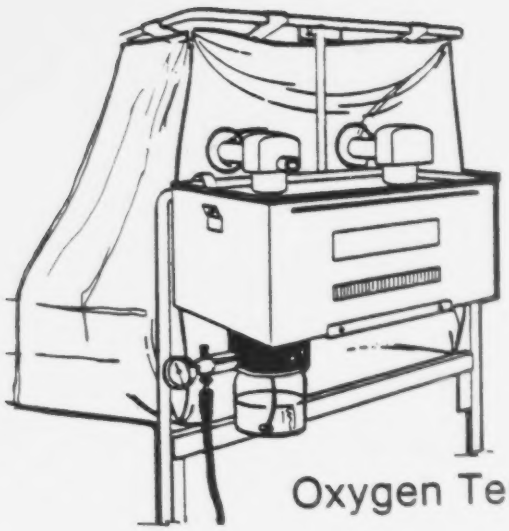
Venturi Mask



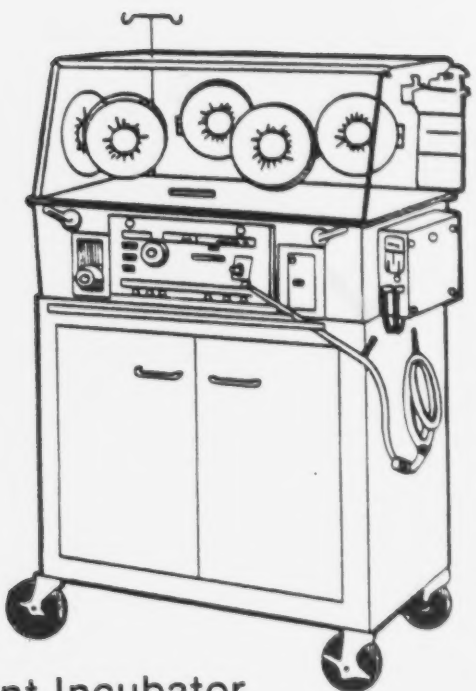
Aerosol Tee Adaptor



Oxygen Hood

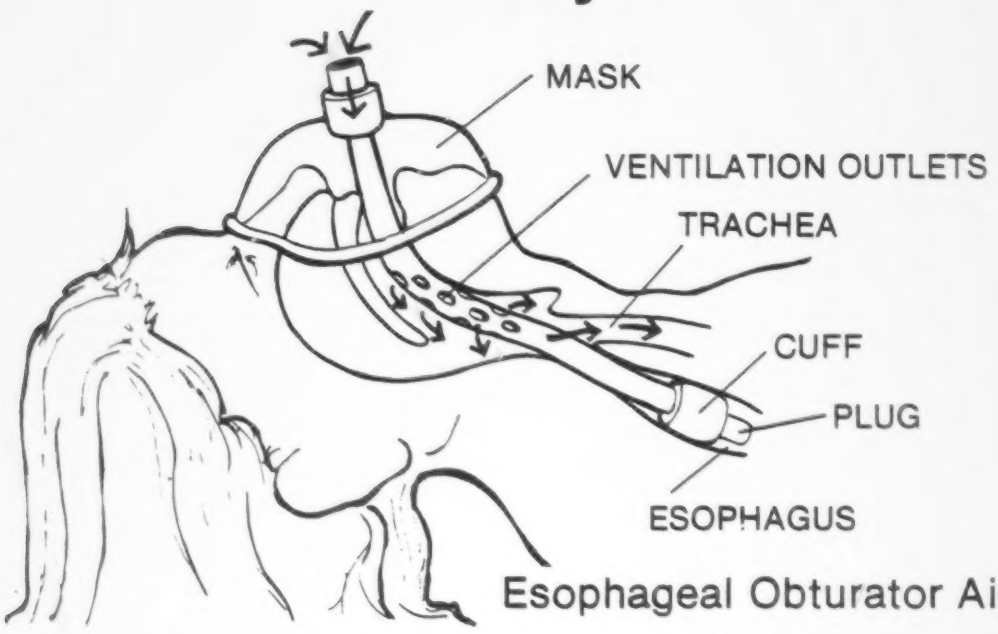


Oxygen Tent

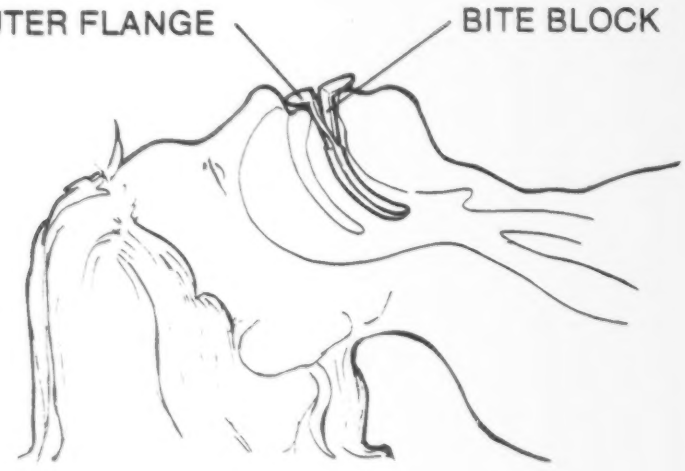


Infant Incubator

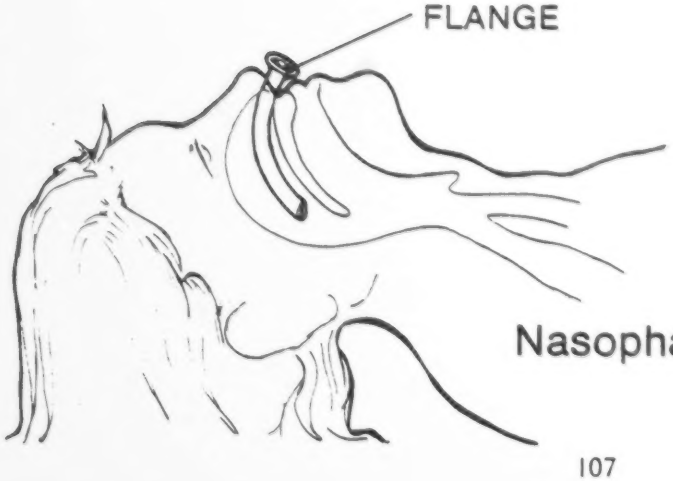
Airways



Esophageal Obturator Airway

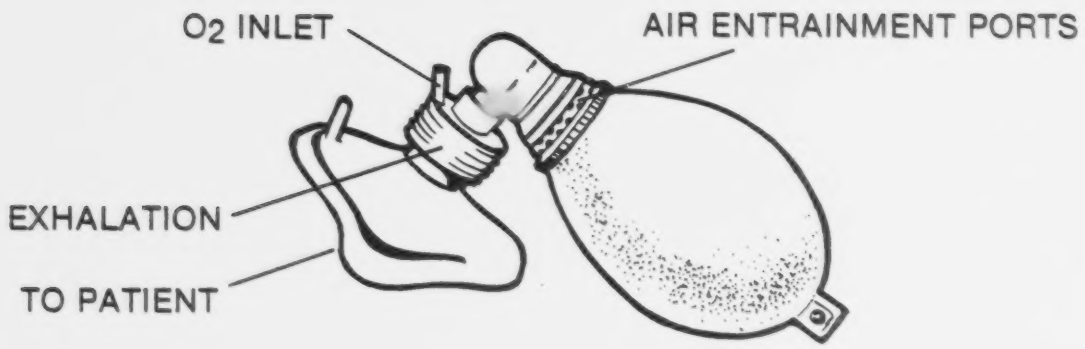


Oropharyngeal Airway

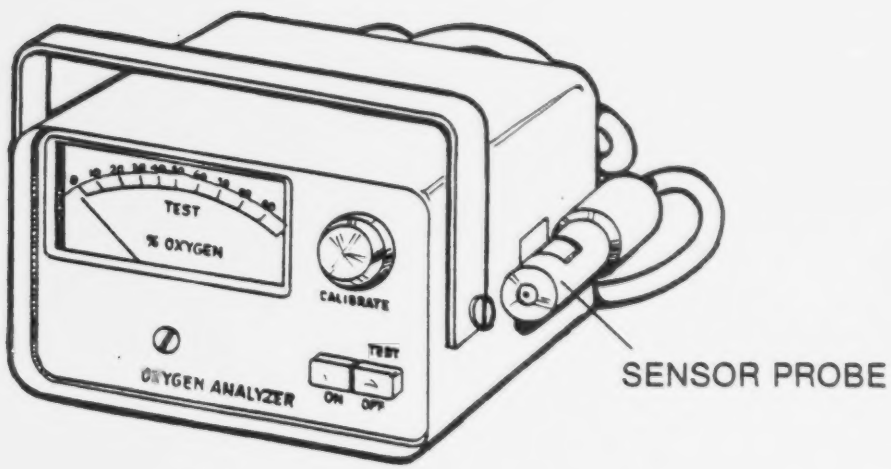


Nasopharyngeal Airway

Other Respiratory Therapy Equipment



Manual Resucitator



Oxygen Analyzer

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VII EQUIPMENT AND LABORATORY MATERIAL TRANSPORTATION

SCOPE OF UNIT:

This unit will teach the correct method of handling and transporting cylinder gases for use with patients. It also will teach the correct manner in which laboratory specimens (arterial blood and sputum samples) are delivered to the appropriate laboratory.

INFORMATION TOPIC: X OR DEMONSTRATION:

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. List two methods by which medical gas cylinders are identified.
2. Match medical gases with the correct color code.
3. Explain the correct method for handling and transporting medical gas cylinders.
4. Describe the pin index safety system.
5. State the purpose of analyzing arterial blood gases.
6. Describe the procedure for delivering arterial blood gas samples to the laboratory for analysis.
7. State the purpose of analyzing sputum specimens.
8. Describe the procedure for delivering sputum samples to the laboratory for analysis.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

Burton, George and John E. Hodgkin. Respiratory Care: A Guide to Clinical Practice. 2nd ed. Philadelphia: J.B. Lippincott Co., 1984.

INTRODUCTION:

There are certain dangers to patients and hospital personnel in the dispensing of medical gases, particularly when handling and transporting large gas cylinders. Various precautions are required to assure that both patients and personnel are adequately protected.

A major part of the practice of respiratory care is in diagnostic testing, to assess the patient's ventilatory function. Arterial blood gas analysis and sputum analysis are two of these tests. Both tests require that the samples be delivered to the appropriate laboratory within a short period of time in order to ensure valid and reliable results.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VII EQUIPMENT AND LABORATORY MATERIAL TRANSPORTATION

OUTLINE: (Key points)

I. Methods of Identification Medical Gas Cylinders (II-1)

A. Label identification

1. Name of gas mixture
2. Percentage of gas mixture(s)
3. Pressure of contents
4. Serial number
5. Manufacturer's mark

B. Color code identification

1. Oxygen - green or white
2. Carbon dioxide - gray
3. Helium - brown
4. Nitrous oxide - blue
5. Breathing air - yellow

II. Handling and Transportation of Medical Gas Cylinders (II-2)

A. Purpose - Proper handling and transporting of large cylinder medical gases is important. If a cylinder toppled over on someone, the weight could cause injury. Also, if the cylinder fell over and hit the floor, the end of the cylinder could move as a projectile or rocket and cause injury to anyone in its path.

B. Handling and transporting

1. In the cylinder storage area, unchain cylinder from wall and roll it onto cylinder truck.
2. Once on truck, fasten cylinder using chain attached to cylinder truck.

3. Remove valve cover over cylinder and "crack" cylinder by quickly rotating valve open, then shut it off by rotating valve in opposite direction. This procedure removes any dust particles from the opening that might obstruct gas as it leaves the regulator.

4. Transport cylinder to patient's room by walking behind cylinder truck and pushing it. Be cautious when turning corners because front of cylinder extends about 3 feet in front of truck which makes turning difficult.

5. Once in patient's room, stand cylinder truck in upright position and attach the regulator using a wrench.

6. Cylinder must be either kept on the truck in an upright position or removed from the truck and placed in a cylinder base (a ring-shaped base that prevents the cylinder from tipping).

C. Pin-index safety system ((II-3)

1. Used with small cylinders, sizes A-E (F-K denotes large cylinders).

2. System includes a yoke attachment that has six holes drilled in it at predetermined distances.

a. Configurations of two holes are used for each type of medical gas (oxygen uses holes 2 and 5).

b. Each type of regulator has pins that prevent a given regulator from being used with the incorrect type of medical gas.

c. Regulator pin arrangements will match hole configurations in yoke attachment and screw is tightened on back of yoke.

III. Arterial Blood Gas Analysis

A. Purpose

1. To assess the degree of oxygenation (or hypoxia)

2. To assess the adequacy of ventilation

B. Procedure for delivering a sample to the lab

1. Pick up the sample from the therapist

2. Confirm patient's name, room number, time of pick-up, and date on requisition.

3. Make sure blood is immersed in ice water (which slows metabolism).

4. According to hospital protocol, transfer sample to respiratory therapy department or to pathology lab within 10 minutes.

5. Take results directly to therapist or ward secretary (depending on policy).

IV. Sputum Specimens

A. Purpose - to confirm and identify the type and amount of organisms in the respiratory system that cause inflammation and infection

B. Procedure for delivering sample to lab (II-4)

1. Use good aseptic technique prior to picking sample up.

2. Confirm patient's name, room number, time of pick-up, date on requisition.

3. Double-check that information is also on label of sputum container.

4. Following hospital protocol, deliver specimen to appropriate lab for analysis.

5. Pathology lab will call results to patient's floor at later date because of time involved in performing the tests.

V. Summary and Conclusion

A. Medical gas cylinder label and markings

B. Handling and transportation of medical gas cylinders

C. Arterial blood gas analysis

D. Sputum specimens

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VII EQUIPMENT AND LABORATORY MATERIAL TRANSPORTATION

INTERACTION ITEMS: (Review Items)

1. How are medical gases identified? What color is an oxygen cylinder?
2. Why is it important to handle and transport cylinder gases in the correct manner?
3. What is the pin-index safety system? What is the pin configuration for oxygen?
4. What is the procedure for delivering a sputum sample to the laboratory?

CLASSROOM, LABORATORY, OR OTHER ACTIVITIES:

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VII EQUIPMENT AND LABORATORY MATERIAL TRANSPORTATION

EVALUATION ITEMS:

1. List two methods by which medical gas cylinders are identified.

   a.

   b.

2. Match the following medical gases with the correct color code:

   a. helium
   b. carbon dioxide
   c. nitrous oxide
   d. oxygen
   e. breathing air

   _ 1. Yellow
   _ 2. Blue
   _ 3. Green or white
   _ 4. Brown
   _ 5. Gray

3. Describe the correct procedure for handling and transporting medical gas cylinders.

4. Describe the pin-index safety system.

5. State the purpose of analyzing arterial blood gases.

6. Describe the correct procedure for delivering an arterial blood gas to the laboratory for analysis.

7. State the purpose of analyzing sputum specimens.

8. Describe the procedure for delivering sputum samples to the laboratory for analysis.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VII EQUIPMENT AND LABORATORY MATERIAL TRANSPORTATION

ANSWERS TO EVALUATION ITEMS:

1. A. By label information
   B. By color code

2. e 1. Yellow
   c 2. Blue
   d 3. Green or white
   a 4. Brown
   b 5. Gray

3. a. In cylinder storage area, unchain cylinder from wall and roll it onto cylinder truck.
   b. Once on truck, fasten cylinder using chain attached to cylinder truck.
   c. Remove valve cover over cylinder and "crack" cylinder by quickly rotating valve open, then shut it off by rotating valve in opposite direction. This procedure removes from opening any dust particles that could obstruct gas as it leaves the regulator.
   d. Transport cylinder to patient's room by walking behind cylinder truck and pushing it. Be cautious when turning corners because front of the cylinder extends about 3 feet in front of truck, making turning difficult.
   e. Once in patient's room, stand cylinder truck in upright position and attach regulator using wrench.
   f. The cylinder must be either kept on truck in upright position or removed from truck and placed in a cyiinder base (a ring-shaped base that prevents cylinder from tipping).

4. The pin-index safety system is used with small cylinder sizes A through E, and includes a yoke attachment, which has six holes drilled in it at predetermined distances. Configurations of two holes are used for each type of medical gas. Each type of regulator has pins on it that prevent a given regulator from being used with the incorrect type of medical gas. The regulator pins will match the hole configurations in the yoke attachment, and a screw is tightened on the back of the yoke.

5. Blood gases are analyzed to assess the degree of oxygenation (or hypoxia) and to assess the adequacy of ventilation.

6. a. Pick up sample from therapist.
   b. Confirm patient's name, room number, pick-up time, and date on requisition.
   c. Make sure the blood is immersed in ice water (which slows metabolism).
   d. According to hospital protocol, transfer sample to respiratory therapy department or to pathology lab within 10 minutes.
   e. Take results directly to therapist or ward secretary (depending on policy).

7. Sputum specimens are analyzed to confirm and identify the type and amount of organisms in the respiratory system that cause inflammation and infection.

8.
1. Use good aseptic technique prior to picking the sample up.
2. Confirm patient's name, room number, pick-up time, and date on requisition.
3. Double-check that information is also on label of sputum container.
4. Following hospital protocol, deliver specimen to appropriate lab for analysis.
5. The pathology lab will call results back to patient's floor at a later date because of time involved in performing tests.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VIII PATIENT TRANSFERS AND BODY MECHANICS FOR THE AIDE

SCOPE OF UNIT:

This unit will address several methods of patient handling and transfer. It will explain the general principles and procedures of moving patients up in bed, patient transfer from bed to chair or wheelchair, and back to bed. As a respiratory therapy aide, the most common patient transfer activities you will encounter will be in transporting patients by wheelchair from their rooms to the respiratory therapy department for pulmonary function studies. You may also be called upon to assist in transporting respiratory patients to the radiology department.

INFORMATION TOPIC: OR DEMONSTRATION: X

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. Demonstrate the basic rules of patient transfer according to steps of procedure.
2. Demonstrate basic body mechanics when transferring patients from bed to chair according to steps of procedure.
3. Correctly perform the procedure for moving a patient up in bed.
4. Demonstrate the procedure of patient transfer from bed to chair or wheelchair, and back to bed.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

1. Hospital bed or a bed that allows the head of the bed to be rolled up.
2. Pillows (2)
3. Chair or wheelchair

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

Rantz, Marilyn and Donald Courtial. Lifting, Moving, and Transferring Patients. St. Louis: C.V. Mosby Company, 1977.

INTRODUCTION:

Most of the injuries that occur in a hospital occur during patient transfer. A lot of unnecessary patient suffering can be avoided by following basic principles for lifting, moving, and transferring patients. Many back injuries to those who attend patients can also be eliminated by using proper bedside transfer techniques and the correct body mechanics.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VIII PATIENT TRANSFERS AND BODY MECHANICS FOR THE AIDE

STEPS OF PROCEDURES:

Rules of Patient Transfer

1. Decide what you are going to do and the easiest way it can be accomplished.
2. If any equipment or assistance is needed, obtain it before beginning.
3. Remove any obstacles before beginning.
4. Tell the patient what you are going to do, and explain how she/he can help.
5. Remember that you will need to reverse the transfer, so plan ahead how you can do it most easily.
6. Complete the transfer, telling the patient what she/he is to do as you go along.

Basic Body Mechanics

1. When lifting or carrying, keep the patient or equipment close to your body. CAUTION: Don't lean or stretch.
2. Carry load at a comfortable height.
3. Use your legs for lifting and keep your back straight.
4. Whenever possible, drag, push, pull, or roll rather than lift.
5. Do not twist the trunk of your body when lifting.
6. Stand with one foot forward to give a broader base of support.

Moving the Patient up in Bed

1. Roll the bed flat and raise the bed to a proper working height.
2. Remove any sheets or coverings that could get in the way.
3. Stand near the head of the patient's bed with your inside foot turned toward the patient's head and the outside foot pointing toward the head end of the bed.
4. Place one arm under the patient's scapulae and lower neck.

5. Instruct the patient to bend his/her knees and place his/her feet flat on the bed in front of him/her.
   Note: The patient may need assistance to do this.

6. On your signal, you and the patient will lift and push toward the head of the bed at the same time.

Patient Transfer from Bed to Chair

1. Place the chair or wheelchair in the locked position at the head end of the patient's bed.

2. Place one or two pillows in the chair or wheelchair.
   Note: This will make it easier to transfer the patient back to bed later.

3. Raise the bed to a comfortable working height.

4. Lower the side rail and begin to move the patient toward you in stages (legs, buttocks, shoulders, and head).

5. Place the side rail back to the up position and raise the head of the bed to a sitting position.

6. Lower the side rail and stand next to the patient.

7. Place one arm around his/her neck and the other under the patient's legs just below the knees.

8. In one motion, move the patient toward you until his/her legs are dangling from the bed.

9. Brace his/her knees against your knees, hold him/her erect, and wait until he/she is stable.

10. Stand directly in front of him/her and slide him/her toward you until his/her feet touch the floor.
    CAUTION: Patient should not be wearing slippery shoes or socks.

11. Block patient's feet with yours to prevent him/her from slipping.

12. On your signal, move the patient forward and upward to a standing position.

13. Turn the patient so that his/her back is facing the chair with his/her legs touching the back of the chair.

14. Place your feet and knees against his/hers and lower the patient into the chair.

Patient Transfer from Chair to Bed

1. Make sure the chair will not slip
   CAUTION: If using a wheelchair, lock the wheels.

2. Place the patient's feet together, and place the inner surface of your feet against the outside of his/hers.

3. Ask the patient to pull him/herself forward, using the armrests.

4. Hold the patient by placing your hands underneath his/her arms (axillae), with your hands resting over his/her scapulae (shoulder blades).

5. With your knees against his/her knees, ask the patient to lean forward and push down with his/her arms, and raise the patient up at the same time.

6. When the patient is in a full standing position, turn his/her legs so they touch the edge of the bed.

7. Position your knees and feet against him/her and lower him/her into the bed.

8. With the patient in the sitting position, place one hand under his/her knees and support his/her back with the other. In one movement, swing the patient back into bed.

Summary and Conclusion

Review steps of procedure.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VIII PATIENT TRANSFERS AND BODY MECHANICS FOR THE AIDE

INTERACTION ITEMS: (Review Items)

1. Why is it important to know the correct techniques for transferring patients?
2. What are the basic rules of patient transfer?
3. What should you do before you actually move a patient up in bed?
4. When moving a patient from a bed to a wheelchair, why do you need to put a couple of pillows in the wheelchair before the patient sits down?
5. When moving a patient from a chair to the bed, what is the first thing you should do before lifting the patient?

CLASSROOM, LABORATORY, OR OTHER ACTIVITIES:

1. Discuss interaction items.
2. Have students practice the basic rules of patient transfer and body mechanics.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT VIII PATIENT TRANSFERS AND BODY MECHANICS FOR THE AIDE

EVALUATION ITEMS:

Did the Student:	Yes	No
RULES OF PATIENT TRANSFER		
1. Decide what to do and the easiest way it can be accomplished.		
2. If any equipment or assistance is needed, obtain it before beginning.		
3. Remove any obstacles before beginning.		
4. Tell the patient what you are going to do and explain how she/he can help.		
5. Remember that you will need to reverse the transfer, so plan ahead how you can do it most easily.		
6. Complete the transfer, telling the patient what she/he is to do, as you go along.		
BASIC BODY MECHANICS		
1. When lifting or carrying, keep the patient or equipment close to your body.		
2. Carry load at a comfortable height.		
3. Use your legs for lifting and keep your back straight.		
4. Whenever possible, drag, push, pull, or roll rather than lift.		
5. Do not twist the trunk of your body when lifting.		
6. Stand with one foot forward to give a broader base of support.		

	Yes	No
MOVING THE PATIENT UP IN BED		
1. Roll the bed flat and raise the bed to a proper working height.		
2. Remove any sheets or coverings that could get in the way.		
3. Stand near the head of the patient's bed with your inside foot turned toward the patient's head and the outside foot pointing toward the head end of the bed.		
4. Place one arm under the patient's scapulae and lower neck.		
5. Instruct the patient to bend his/her knees and place his/her feet flat on the bed in front of him/her.		
6. On your signal, you and the patient will lift and push toward the head of the bed at the same time.		
PATIENT TRANSFER FROM BED TO CHAIR		
1. Place the chair or wheelchair in the locked position at the head end of the patient's bed.		
2. Place one or two pillows in the chair or wheelchair.		
3. Raise the bed to a comfortable working height.		
4. Lower the side rail and begin to move the patient toward you in stages (legs, buttocks, shoulders, and head).		
5. Place the side rail back to the up position and raise the head of the bed to a sitting position.		
6. Lower the side rail and stand next to the patient.		
7. Place one arm around his/her neck and the other under the patient's legs just below the knees.		
8. In one motion, move the patient toward you until his/her legs are dangling from the bed.		

		Yes	No
9.	Brace his/her knees against your knees, hold him/her erect, and wait until he/she is stable.		
10.	Stand directly in front of him/her and slide him/her toward you until his/her feet touch the floor.		
11.	Block his/her feet with yours to prevent him/her from slipping.		
12.	On your signal, move the patient forward and upward to a standing position.		
13.	Turn the patient so that his/her back is facing the chair with his/her legs touching the back of the chair.		
14.	Place your feet and knees against his/hers and lower the patient into the chair.		
PATIENT TRANSFER FROM CHAIR TO BED			
1.	Make sure the chair will not slip.		
2.	Place the patient's feet together, and place the inner surface of your feet against the outside of his/hers.		
3.	Ask the patient to pull him/herself forward using the armrests.		
4.	Hold the patient by placing your hands underneath his/her arms (axillae), with your hands resting over his/her scapulae (shoulder blades).		
5.	With your knees against his/her knees, ask the patient to lean forward and push down with his/her arms and raise the patient up at the same time.		
6.	When the patient is in a full standing position, turn his/her legs so they touch the edge of the bed.		
7.	Position your knees and feet against him/her and lower him/her into the bed.		

	Yes	No
8. With the patient in the sitting position, place one hand under his/her knees and support his/her back with the other. In one movement, swing the patient back into bed.		

The student has satisfactorily completed the procedure "PATIENT TRANSFERS AND BODY MECHANICS" according to the steps outlined.

_____

Instructor's Signature
(Verifying Satisfactory Completion)

_____

(Date)

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IX EQUIPMENT AND SUPPLY INVENTORY

SCOPE OF UNIT:

This unit will explain the importance of establishing and maintaining an efficient inventory of respiratory therapy equipment and supplies. It also will include a discussion of the inventory process and examine one method of classifying equipment and supplies for inventory purposes. We'll learn about the function of equipment substations in a hospital and your role in maintaining proper inventory levels in each substation.

INFORMATION TOPIC: X OR DEMONSTRATION

UNIT OBJECTIVES - THE STUDENT WILL BE ABLE TO:

1. Explain the purpose of maintaining an inventory of respiratory therapy equipment and supplies.
2. List the eight functional categories by which respiratory therapy equipment and supplies are grouped for inventory purposes.
3. List three steps involved in procuring respiratory therapy equipment and supplies.
4. Explain the rationale for maintaining respiratory therapy equipment substations on patient care floors.

SUPPLEMENTARY TEACHING/LEARNING ITEMS:

INFORMATIONAL ASSIGNMENT: (Student)

REFERENCES: (Instructor's Additional Information)

McLaughlin, Arthur J. Organization and Management for Respiratory Therapists. St. Louis: C. V. Mosby Company, 1979.

INTRODUCTION:

As a respiratory therapy aide, one of your primary duties will be to ensure that the respiratory therapy department and substations are supplied. You will be responsible for identifying and locating equipment. You'll also need to be familiar with how to purchase equipment and supplies because the respiratory therapy aide typically is involved in receiving from the purchasing department.

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IX EQUIPMENT AND SUPPLY INVENTORY

OUTLINE: (Key Points)

I. Maintaining an Equipment and Supplies Inventory (II-1)

A. Purpose

1. To provide supply service efficiently

2. To use equipment and supplies efficiently

3. To provide a cushion between forecast and actual demand for equipment and supplies

B. Inventory is taken daily, weekly or monthly, depending on the needs of RT department and suppliers.

C. Inventory record system (II-2)

1. Each item is assigned an index card on which the following information is recorded:

a. Name of the apparatus

b. Inventory number

c. Date of release

d. Date of return

2. Cards are grouped by the type of function of the equipment and then color coded for effective inventory of equipment.

3. In addition to the index card system, a peg board system may be used to indicate location of equipment by ward, patient room, or equipment substation.

II. Classification of Equipment and Supplies (II-3)

A. Humidification devices

1. Used to humidify air or oxygen for use in various treatment delivery techniques

2. Types

a. Gas-powered nebulizers and humidifiers

b. Ultrasonic nebulizers

c. Electrically-powered humidifiers

d. Heaters

B. Mechanical ventilators

1. Used to assist or control breathing of patients who are not able to maintain adequate ventilation on their own

2. Types

a. Bennett MA-1

b. Bourns Bear 1

c. Infant ventilators

C. Clinical monitoring devices

1. Used to make clinical measurements to aid in diagnosing or following a patient's progress

2. Types

a. Oxygen analyzers

b. Wright respirometers

c. Pulmonary function equipment

d. Other manometers

D. Disposable equipment

1. Designed for one-time patient use; all RT departments use disposable equipment to varying degrees

2. Includes:

a. Cannulas

b. Oxygen masks and tubing

c. Aerosol masks and collars

d. Medication nebulizers

e. Incentive spirometry devices

f. Humidifiers

E. Equipment and supplies for cleaning RT equipment

1. Used to clean and process the equipment that is used at patient's bedside

2. Includes:

a. Washers

b. Dryers

c. Pasteurizers

d. Sterilizers

e. Liquid disinfectants

F. Intermittent Positive Pressure Breathing machines (IPPB)

1. Used to increase patient ventilation or deliver medication

2. Includes:

a. Bennett and Bird IPPB machines

b. Incentive spirometers

c. Exercise equipment

d. Blow bottles

G. Pressure regulating devices

1. Used to reduce gas cylinder pressure to a safe level

2. Includes:

a. Flowmeters

b. Regulators

c. Pressure-reducing valves

H. Office equipment and supplies - items used in routine management of department records

III. Procuring Equipment and Supplies

A. Department requisition - respiratory therapy department submits requisition to purchasing department

B. Purchasing - purchasing department assigns purchase order (PO) number and includes time and date

C. Receiving

1. All items received will have invoice included, which must be sent to accounts payable department.

2. Person receiving the order must sign his/her name, verifying that the order was delivered.

3. Check delivery

a. Items that were not ordered

b. Outdated material

c. Damaged or defective material

d. Quantity shortages (II-5)

IV. Equipment Substations

A. Rationale - to ensure that equipment and supplies can be delivered to the patient's bedside quickly

1. Most substations are located on patient care floors near intensive care units, where emergency equipment and supplies are readily accessible.

2. Saves work hours

B. Type of equipment and supplies will vary from hospital to hospital. A typical substation will contain the following items:

1. At least a dozen each of the disposable equipment that the respiratory therapy department stocks

2. Air compressors and IPPB machines for patient therapy

3. Small cylinders of oxygen for ambulation and emergencies

4. At least one or two mechanical ventilators ready for patient use

5. Flowmeters, regulators, and clinical monitoring devices

V. Summary and Conclusion

A. Maintaining an equipment and supplies inventory

B. Classification of equipment and supplies

C. Procuring equipment and supplies

D. Equipment substations

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IX EQUIPMENT AND SUPPLY INVENTORY

INTERACTION ITEMS: (Review Items)

1. Why is it important to maintain a system for inventorying respiratory therapy equipment?

2. Explain one method of tracking the location and availability of respiratory therapy equipment.

3. Describe the categories into which equipment and supplies can be grouped for inventory purposes.

4. What is the first step in procuring a piece of respiratory equipment?

5. What should you do prior to signing your name to an invoice verifying that you have received ten cases of aerosol tubing?

CLASSROOM, LABORATORY, OR OTHER ACTIVITIES:

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IX EQUIPMENT AND SUPPLY INVENTORY

EVALUATION ITEMS:

1. Why is it important to keep accurate inventory of respiratory therapy equipment and supplies?

2. List eight functional categories into which equipment and supplies are grouped.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

   h.

3. List the three steps involved in procuring equipment and supplies.

   a.

   b.

   c.

4. What is the rationale for maintaining equipment substations?

COURSE TITLE: RESPIRATORY THERAPY AIDE

UNIT IX EQUIPMENT AND SUPPLY INVENTORY

ANSWERS TO EVALUATION ITEMS:

1. To provide supply service efficiently, to use equipment and supplies efficiently, and to provide a cushion between forecast and actual demand for equipment and supplies.

2. a. Humidification devices
   b. Mechanical ventilators
   c. Clinical monitoring devices
   d. Disposable equipment
   e. Equipment and supplies for cleaning RT equipment
   f. IPPBs
   g. Pressure regulating devices
   h. Office equipment and supplies

3. a. Department requisition
   b. Purchasing
   c. Receiving

4. To ensure that equipment and supplies can be delivered to the patient's bedside quickly

REFERENCES

Brady's Programmed Orientation to Medical Terminology. Philadelphia: J.B. Lippincott Co., 1970.

Burton, George and John E. Hodgkin Respiratory Care: A Guide to Clinical Practice. 2nd ed. Philadelphia: J.B. Lippincott Co., 1984.

McLaughlin, Arthur J. Organization and Management for Respiratory Therapists. St. Louis: C.V. Mosby Company, 1979.

Rantz, Marilyn and Donald Courtial. Lifting, Moving, and Transferring Patients. St. Louis: C.V. Mosby Company, 1977.

Competency Certificate

This is to Certify that:

_____

Achieved the Job Competencies
as Acknowledged for

Respiratory Therapy Aide

And is Therefore Recognized

This _____ *Day of* _____, *19*_____

_____ _____

Instructor *Administrator*

COMPETENCY PROFILE FOR RESPIRATORY THERAPY AIDE

Student Final Record

Student Name: _____
Last First Middle

Permanent Address: _____

Social Security Number: _____ Instructor's Signature: _____

Directions: This profile provides a permanent record for student, instructor, and/or industry representative. The competencies listed below correspond directly to the units presented in this curriculum guide. Compile your evaluation of the student (trainee) by transferring the appropriate "yes/no" rating from the various demonstration units, or by indicating "yes/no" if the student (trainee) has mastered objectives contained in information units.

YES	NO	
		OVERVIEW OF THE RESPIRATORY CARE PROFESSION
____	____	1. List areas in which respiratory therapy is involved with patient services.
____	____	2. List procedures provided by respiratory therapy.
____	____	3. List conditions/diseases of patients who receive respiratory therapy treatment.
____	____	4. State when the National Board for Respiratory Care was established.
____	____	5. List clinical uses of oxygen therapy.
____	____	6. Distinguish between educational programs of various respiratory care practitioners.
		TERMINOLOGY USED IN RESPIRATORY THERAPY
____	____	7. Define the parts of a word.
____	____	8. Match respiratory therapy terms to definitions.
		BASIC INFECTION CONTROL
____	____	9. Wash hands.
____	____	10. Maintain asepsis while handling equipment.
____	____	11. Demonstrate isolation technique.
		BASIC TELEPHONE TECHNIQUES
____	____	12. List criteria for answering incoming telephone calls.
____	____	13. List steps in recording phone messages.
____	____	14. Identify proper method of terminating a telephone conversation.
____	____	15. Identify effective and ineffective telephone techniques.
____	____	16. Describe correct response to situations the aide would encounter when answering the phone in a respiratory therapy department.
		CLINICAL PROCEDURES AND THERAPEUTIC DELIVERY METHODS
____	____	17. List indications for oxygen therapy.
____	____	18. List indications for aerosol and humidity administration.
____	____	19. Describe the rationale for lung expansion therapy.
____	____	20. List indications for the use of chest percussion/chest physiotherapy.
____	____	21. List indications for naso-tracheal suctioning.
____	____	22. List categories of diagnostic and patient monitoring procedures.
____	____	23. List goals of pulmonary rehabilitation and patient education.
		EQUIPMENT AND LABORATORY MATERIAL TRANSPORTATION
____	____	24. List methods by which medical gas cylinders are identified.
____	____	25. Match medical gases with correct color code.
____	____	26. Explain the correct method for handling and transporting medical gas cylinders.
____	____	27. Describe the pin index safety system.
____	____	28. State the purpose of analyzing arterial blood gases.
____	____	29. Describe the procedure for delivering arterial blood gas samples to the laboratory for analysis.
____	____	30. State the purpose of analyzing sputum specimens.
____	____	31. Describe the procedure for delivering sputum samples to the laboratory for analysis.
		PATIENT TRANSFERS AND BODY MECHANICS FOR THE AIDE
____	____	32. Demonstrate basic rules of patient transfer.
____	____	33. Demonstrate basic body mechanics when transferring patients from bed to chair.
____	____	34. Correctly perform the procedure for moving a patient up in bed.
____	____	35. Demonstrate the procedure of patient transfer from bed to chair or wheelchair, and back to bed.
		EQUIPMENT AND SUPPLY INVENTORY
____	____	36. Explain the purpose of maintaining an inventory of respiratory therapy equipment and supplies.
____	____	37. List eight functional categories by which respiratory therapy equipment and supplies are grouped for inventory purposes.
____	____	38. List three steps involved in procuring respiratory therapy equipment and supplies.
____	____	39. Explain the rationale for maintaining respiratory therapy equipment substations on patient care floors.